PSYCHOLOGICAL DYSFUNCTION, DRUG TREATMENT ENGAGEMENT, AND HIV RISK BEHAVIOR AMONG METHADONE MAINTAINED CLIENTS

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The impact of opiate addiction on public health has been severe with its links to disease, death, economics, and mental health problems. Many opiate addicts inject drugs several times each day which has been associated with many infectious diseases, including: Hepatitis B and C, tuberculosis, and HIV/AIDS (National Institutes on Drug Abuse, 2000). This study investigated the relationships of psychological dysfunction, drug treatment engagement, HIV risk reduction attitudes, and HIV risk behaviors among methadone maintained clients. It was guided by the AIDS Risk Reduction Model (ARRM), a heuristic device that helps to explain/predict behavior change of individuals in relationship to sexual and injection drug use transmission of HIV/AIDS.

A quantitative cross-sectional research design was utilized to examine the relationship between psychological dysfunction and HIV risk behavior among methadone maintained clients and how drug treatment engagement and HIV risk reduction attitudes affect this relationship. A total of 200 participants who were at least 18 years old and were enrolled in methadone maintenance treatment were included in this investigation.

This study found that 60% of the participants had experienced moderate to high levels of psychological dysfunction. Psychological dysfunction was categorized into past depression, anxiety, and hostility symptoms.

Multiple regression analyses showed that overall psychological dysfunction and drug treatment engagement predicts HIV risk behavior among methadone maintained individuals ($F=13.06$; $p<.000$). However, when the standardized regression coefficients of the individual independent variables were examined, only drug treatment engagement was found to significantly contribute to the prediction of HIV risk behavior ($\beta=-.22$; $p< .01$), indicating that those who reported higher levels of treatment engagement had lower levels of HIV risk behavior.

The mediating role of drug treatment engagement on the relationship between psychological dysfunction and HIV risk behavior was supported. Although, it was not supported for HIV risk reduction attitudes, analysis showed that HIV risk reduction attitudes were moderately and significantly correlated with HIV risk behavior.

The findings of this study provide social work and public health practitioners who work in the field of drug and alcohol treatment and HIV prevention with vital information This study underscores the need for early identification and modification of psychological problems among methadone maintained individuals. Drug treatment provides a vital opportunity to address psychological problems and HIV risk behavior, there is an irrefutable need for the social work and public health professionals to further research and develop/refine interventions to prevent the spread of HIV disease among this population. Early screening and treatment of psychological problems may help increase drug treatment engagement rates which may reduce HIV risk behavior and ultimately save lives among methadone maintained clients.

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1.0 INTRODUCTION

1.1 STATEMENT OF PROBLEM

It has been estimated that over one million people in the United States are addicted to heroin, prescription painkillers, and other opiates (National Drug Intelligence Center, 2004). In fact, opiate addiction has surpassed cocaine addiction to become the most common substance abuse diagnosis behind alcoholism (DHHS, 1999).

Opiate addiction severely impacts public health and is related to disease, premature death, and mental health problems. More specifically, opiate addicts are significantly more likely than the general population to acquire infectious diseases, including: Hepatitis B and C, tuberculosis, and HIV/AIDS (National Institutes on Drug Abuse, 2000). Specifically, about one third of adult and adolescent HIV/AIDS cases in the U. S. have been associated with injection drug use and the prevalence rate of Hepatitis C is up to 90% among injection drug users (National Institutes of Health, 1999). Opiate related deaths (over-doses) increased by 74% during the 1990s and continue to grow in the 2000s. The economic cost of opiate addiction when left untreated (with its links to illness, crime, and mental health) is an estimated $20 billion each year (National Institutes of Health, 1997).

Psychological problems are common among individuals addicted to opiates (Croughan et al., 1982; Rounsaville et al., 1982; Kranzler & Liebowitz, 1988; Brienza et al., 2000). The

presence of a psychological problem in addition to a drug problem (co-occurring disorders) can have serious implications on the adoption of preventive health behavior. For example, some psychological problems (depression and anxiety) may trigger drug cravings and have been associated with increased sexual risk behavior and higher levels of injection-related risk taking which ultimately increases the risk for contracting HIV (Marks et al., 1998; Thompson et al., 1996).

Within the past 5 years, many of the new HIV cases have been among injection drug users and it has been estimated that approximately 40,000 new infections occur each year (Center for Disease Control, 2005). Although, injection drug use (needle sharing) is the primary mode of HIV transmission among drug users, sexual transmission of HIV is also high among drug using individuals (Kral et al., 2001; Strathdee et al., 2001). Transmission of HIV can be reduced among opiate addicts by making drug treatment available to those that want help. According to the World Health Organization, drug treatment as a prevention strategy for HIV/AIDS among opiate addicts is much more effective than typical prevention efforts that only focus on safer needle and/or safer sex practices. Drug treatment have been found to reduce drug use, injection frequency, and associated HIV risk-taking behavior (World Health Organization, 2004).

Past research suggests that individuals who enter drug treatment with more severe psychological problems perform worse during drug treatment (Woody et al., 1984). Specifically, these individuals have more negative drug treatment experiences (Camacho, Brown & Simpson, 1996). For example, depressed individuals are less likely to abstain from drugs and the complexity and severity of their psychological problems can hinder their efforts to reduce drug use and to engage in drug treatment (Kosten et al., 1986; Simpson, 2001). Psychological

problems, in addition to opiate addiction and lack of drug treatment engagement, may continue to put these individuals at risk for contracting and spreading HIV (Rao et al., 2004). Drug treatment provides an opportunity to address psychological problems that may otherwise go untreated. If untreated, psychological problems may affect readiness to modify HIV risk behaviors, a main principle of behavior change models. Accordingly, enrolling opiate addicts in drug treatment allows for assessment and treatment of psychological problems and may help in the adoption of HIV risk reduction methods.

1.2 PURPOSES OF THE STUDY

The purpose of this study is to examine the extent to which psychological problems, drug treatment engagement, and HIV risk attitudes impact HIV risk behavior in a sample of methadone maintained clients. Specifically I: (1) First examine the prevalence of psychological dysfunction (i.e., depression, anxiety, and hostility), drug treatment engagement (i.e., counseling rapport, treatment satisfaction, and treatment participation), and the level of HIV risk behavior (injection drug use, non-injection drug use, and sexual behavior) in the sample, (2) then I examine the relationship between psychological dysfunction and HIV risk behavior, (3) next I explore the relationship between psychological dysfunction and drug treatment engagement, (4) I then investigate the direct and indirect effects of drug treatment engagement on HIV risk behavior, (5) and finally, I test the direct and indirect effects of HIV risk attitudes on HIV risk behavior.

1.3 SIGNIFICANCE OF THE STUDY TO SOCIAL WORK AND PUBLIC HEALTH

Currently, relatively little research examines HIV risk-taking behavior of individuals who have co-occurring disorders (substance use disorder and mental health disorder- i.e. depression, anxiety, hostility). Although there are studies that focus on the problems that opiate addicts face, there is little research that identifies psychological, risk reduction attitudes, and behavioral predictors of HIV risk behavior among this population. Many studies that examine HIV risk behavior either typically focus on sexual behaviors or on injection drug use behaviors. This study will not only focus on both sexual and injection drug use risk behavior but will also include non-injection drug use risk (due to its disinhibiting effects) when examining HIV risk behaviors. In addition, to my knowledge very few studies have focused on more than one psychological problem when examining the relationship between psychological dysfunction and HIV risk behavior (Brooner et al., 1997; Darke & Ross, 1997; Rousaville et al., 1982). There are many psychological problems (anxiety, depression, hostility) common among opiate addicts. In order to capture the problems that addicts face this study will examine multiple psychological problems (independently and as a whole-psychological dysfunction) and will build on existing research by examining possible mediators in such relationships (i.e., drug treatment engagement and HIV risk attitudes).

The results of this study may help professionals identify and modify the predictors of HIV risk behavior, which may help prevent the transmission of HIV and ultimately save lives. Given the importance of drug treatment, as an opportunity to address drug use and sexual behavior as routes of HIV transmission, there is an irrefutable need for the social work/public

health profession to further research and determine the unique needs of clients with co-occurring disorders.

2.0 LITERATURE REVIEW

2.1 CO-OCCURRING DISORDER

Co-occurring disorder refers to a substance use disorder and a psychological disorder (SAMHSA, 2006). In 2002, 33.2 million adults in the United States aged 18 or older had a psychological disorder or a substance related disorder (SAMSHA, 2006). Overall, 13.4 million (40.4%) had only a psychological disorder, 15.7 million (47.4%) had only a substance related disorder and 4.0 million (12.2%) had both psychological disorder and a substance related disorder (i.e., co-occurring disorder) (SAMHSA, 2006). Adults with substance related disorders were almost three times more likely to have serious mental illness (20.4%) than those who did not have a substance related disorder (7.0%) (SAMHSA, 2006). The prevalence of psychological disorders was 19.0 percent among those with alcohol dependence or abuse, 29.1 percent among those with illicit drug dependence or abuse, and 30.1 percent among adults who had both drug and alcohol dependence or abuse (SAMHSA, 2006).

The co-occurrence of psychological disorders and substance related disorders is a significant problem for people in drug and alcohol treatment. In fact one of the strongest predictors of relapse and other unfavorable drug treatment outcomes is the co-occurrence of a psychological disorders and a substance use disorder (Hawkins et al., 2005).

2.2 METHADONE MAINTENANCE TREATMENT

Since the 1960s, methadone maintenance treatment (MMT) has been the most commonly used and the most effective treatment for opiate addiction (Ball, 1991). With the high prevalence of HIV/AIDS among opiate/injection drug users (IDUs), increased interest in MMT has grown among policy makers, public health professionals, and non-methadone prescribing drug treatment facilities. Methadone maintenance treatment has been found to significantly reduce the frequency of injection drug use and has also been shown to decrease sexually related high-risk behavior (Grella & Wugalter, 1997).

Methadone is a long-acting narcotic medication that suppresses symptoms of opiate withdrawal and reduces cravings for opiates without causing euphoric or sedative effects (Dole, 1998). Methadone maintenance treatment is designed to reduce illegal and harmful opiate use along with the many problems (e.g. crime, death, disease) associated with its addiction. The primary goals of MMT are to decrease and/or eliminate opiate use, to reduce criminal behavior, to and prevent HIV/AIDS. For opiate addicts, methadone maintenance treatment is an important point of contact with service providers, because it provides an opportunity to educate drug users about harm reduction approaches (condom usage, needle exchange, beneficial effects of methadone, effective needle/crack pipe cleaning methods) and to address their drug problems and mental health needs (SAMHSA, 2005).

Due to past practices and misperceptions, MMT has yet to be widely accepted as a credible treatment modality. Throughout its history, MMT has been the recipient of pessimistic attitudes and actions by its opponents. Some of the public has opposed the use of methadone for treating opiate addiction and government policies have prevented access to MMT in many communities. Many opponents of MMT perceive opiate addiction as a “bad habit” or moral

flaw, and dismiss MMT as a useless, addictive narcotic substitution therapy. Conversely, others argue that MMT is not a mere replacement for other illicit opiates and that it does not merely substitute one addiction for another (NIH, 1997). Although methadone can cause physical dependence, its effects on the brain contrast sharply with the addictive cycle of highs and lows produced by other opiates (SAMHSA, 2003). A key benefit of MMT is that methadone taken orally once a day permits clients to have a stable lifestyle (e.g., no drowsiness, no cravings, or withdrawal symptoms). This stability provides the opportunity for the addict to stop habitual drug seeking and taking, engaging in HIV risk behaviors, and committing crimes (NIH, 1999).

In addition to its benefits for the individual user, methadone maintenance treatment is a more cost effective alternative for opiate addiction than incarceration or hospitalization. For example, it estimated that it costs approximately $42,000 per year to leave a drug abuser untreated in the community, $40,000 if the addict is incarcerated, and about $4,000 if the addict is admitted to a MMT program (SAMHSA, 1999). Further, when addicts are enrolled in MMT their illegal activity declines by 52% and full time employment increases by 24%. Taken as a whole, methadone maintenance treatment has helped millions of people recover from opiate addiction; allowing addicts to stop criminal behavior, restore their health, mend family and social relationships, and gain employment (SAMHSA, 1999).

2.3 HIV RISK BEHAVIOR

The ways in which injection drug use puts individuals at risk of HIV varies. For example, one may be put at risk by sharing needles or drug equipment (spoons, cotton, crack pipes, and cookers) used to prepare drugs for use. HIV risk may also occur by injecting drugs with a

contaminated syringe. Indirect HIV risk transmission may occur when drugs are contaminated in the mixing process. HIV injection risk may also be related to frequency of injecting drugs along with where the individual gets his or her needles (i.e., shooting galleries, partner/spouse, pharmacy, or network of drug using friends).

Sexual behavior is another route of HIV risk transmission. Sexual activity provides a path for the exchange of body fluids. High risk sexual behavior includes: trading sex for drugs or money, having multiple sex partners, having sex without a condom, having sex with a known drug user, having anal sex, and having sex while high on drugs or alcohol. Non-injection drug use is also associated with HIV risk behavior, either as a result of increased libido caused by certain drugs like crack cocaine and methamphetamine or by drug or alcohol use causing individuals to be disinhibited (Marks et al., 2006).

2.4 PSYCHOLOGICAL DYSFUNCTION AND HIV RISK BEHAVIOR

The relationship between psychological dysfunction and HIV risk behavior has been studied by a number of researchers. These studies have suggested that psychological problems predict drug-related and sex-related HIV risk behavior (Avants et al., 2000; Williams & Latkin, 2005; Metzger et al., 1991; Stein et al., 2003; Perdue et al., 2003). In the addiction literature, psychological disorders(e.g., depression, antisocial personality disorder, and social anxiety) and personality style (neuroticism and conscientiousness) have been identified as some of the predictors of HIV risk behavior among drug users (Bronner et al., 1997; Camacho et al. 1996; Metzger et al., 1991). For example, a study that examined the relationship psychological dysfunction and HIV risk behavior among 834 opiate drug users in methadone treatment found

that psychological dysfunction was significantly related to needle sharing risk in terms of injecting with used needles, sharing works (drug paraphernalia), and sharing needles with an unfamiliar person (Camacho, Brown, & Simpson, 1996). Psychological problems were also associated with sex risk in terms of number of sex partners, unprotected sex with known injection drug users, and prostitution (Camacho, Brown, & Simpson, 1996).

The results of a recent meta-analytic review that examined whether depressive symptomatology, anxiety, and anger were associated with sexual behaviors of 34 studies of various populations (injection drug users, gay men, youth, and women), provided little support that psychological problems were associated with sex risk behavior. The authors suggested that the lack of association between psychological problems and sexual risk behavior may be the result of research designs (cross-sectional) that past research used. One key limitation of this study is that it did not address drug-related HIV risk behavior, which is characteristic of the various sample types that were included in their study (youth, homosexuals, women, and injection drug users). Because of this limitation the extent to which there is an association between psychological problems and HIV risk behavior has yet to be determined. In fact, more recent studies have found a relationship between psychological problems and HIV risk behavior among drug users (Williams & Latkin, 2005; Perdue et al., 2003; Stein et al., 2003; Crepaz & Marks, 2001).

2.4.1 Depression and HIV Risk Behavior

In addition to the high prevalence of HIV/AIDS among drug using populations, depression is also common (Brooner et al., 1997; Darke & Ross, 1997; Rousaville et al., 1982). Past studies have shown that lifetime and current rates of major depression for this population are 20% to

50% and 10 to 20% respectively (Nunes et al., 1994; Hasin & Nunes, 1998). Depression has been shown to impede the adoption of protective HIV behavior. Orr et al. (1994) posit that depression affects the adoption of health behaviors because it produces hopelessness and despair, which in turn, impede behavior change. Other research suggests that depression may trigger drug craving for those enrolled in drug treatment. This drug craving may cause the individual to relapse, which is associated with continued HIV risk taking behavior through injection drug use practices, non-injection drug use, and risky sexual behavior (Stein et al., 2003).

A cross-sectional study of black women attending urban health centers who had higher levels of depressive symptomatology were significantly more likely than women with lower depressive symptoms to report more risk factors for HIV (Orr et al., 1994). Similarly, longitudinal studies of the depression and HIV risk behavior link found that injection drug users with higher levels of depressive symptoms at baseline and at a six month follow-up significantly predicted increased changes in injection drug use and HIV risk behaviors (Hawkins et al., 1998; Latkin & Mandell, 1992).

Other studies found that among 1228 injection drug users completing the Center for Epidemiologic Studies Depression Scale (CES-D), higher scores were significantly associated with sharing needles, sharing drug equipment, and practicing backloading (use of a syringe to divide drugs before injection). In addition, a longitudinal study examining the relationship between depressive symptoms and sexual HIV risk behaviors among 332 inner-city drug users found that high depressive symptoms are causally related to having sex with mutiple partners and having sex with known injection drug and crack users (Perdue et al., 2003; Williams & Latkin , 2005). A similar relationship between depression and HIV risk behavior was found among 405 drug treatment clients. Specifically, researchers found that clients with higher scores on the Beck

Depression Inventory were more likely to engage in risky HIV related drug injection practices than those with lower scores (McCusker et al., 1995). However, this relationship did not stand true when analyzing the relationship between depression and HIV sexual risk behavior.

2.4.2 Anxiety and HIV Risk Behavior

The prevalence of mood and anxiety disorders are more pronounced among those addicted to opiates when compared with the general population. A study of 533 opiate addicts receiving treatment found that 70% met the criteria for having a current psychiatric disorder, over 11% met the criteria for having anxiety disorder (Rounsaville et al., 1982). In a more recent study of 116 respondents, which measured the prevalence of anxiety disorder in a substance dependent population, more than half of the sample reported heroin as their drug of choice with 11% reporting use of heroin intravenously. In this sample, 39% had a current diagnosis of anxiety disorder, and 53% showed lifetime prevalence for anxiety disorder (Franken and Hendricks, 2001).

A small number of studies have demonstrated a positive relationship between anxiety and HIV risk behavior. For example, Malow et al. (1992) found that among 170 treatment-seeking drug abusers, those reporting higher anxiety scores reported engaging in significantly more HIV needle risk behaviors (frequency of injection drug use, sharing needles, and lack of clean needles). Specifically, a high anxiety group created from anxiety scores on the State-Trait Anxiety Scale was significantly more likely to be engaged in injection risk behavior (a composite index) than either the moderate or low anxiety group. However, sexual risk behavior (a composite index) was not related to higher anxiety scores among this sample.

Another study examined the relationship between psychological functioning and HIV risk behavior among 194 injection drug users (Simpson, Knight, and Ray, 1993). This study explored measures of anxiety, depression, decision-making, and self-esteem in relationship to HIV injection and sex risk behavior. In regards to anxiety, needle risk behavior was associated with anxiety but was not related to sex risk. Similarly, a study examining the relationship of psychological dysfunction and HIV risk behavior among opiate drug users in methadone treatment, found that anxiety (included in an overall measure of psychological dysfunction) was significantly related to needle sharing risk behaviors including injecting with used needles, sharing works (drug paraphernalia), and sharing needles with an unfamiliar person. Anxiety was also associated with sex risk in terms of number of sex partners, unprotected sex with known injection drug users, and prostitution (Camacho, Brown, and Simpson, 1996).

2.4.3 Hostility and HIV Risk Behavior

Past research has shown that opiate addicts have a high prevalence of elevated levels of hostility (Chien 1980; Ahmad, Ramalingum, & Ahmad, 1984). Research among 727 former methadone treatment clients found that increased levels of hostility predicted increased drug use after treatment. Specifically, former methadone clients with higher levels of hostility were more likely to use cocaine/crack on a weekly basis. In fact, each additional one-point increase for hostility almost tripled the odds of weekly cocaine/crack use. Those who used cocaine/crack are said to be at high risk to contract HIV because many of them often trade sex for drugs or money with multiple partners (Rao, Broome, and Simpson, 2004).

Another study on the relationship between hostility and drug use among 323 drug-users found that increased levels of hostility were significantly associated with HIV injection risk behavior (Metzger et al., 1991). Similarly, among 255 in and out-of-treatment drug users, those who shared needles had significantly higher scores on a hostility measure and were more likely to have HIV (Woody et al., 1997). In sum, past research finds that psychiatric severity is a significant predictor of injecting; especially needle sharing, which is probably the single most risky behavior among drug users (Stein, 2003).

2.5 DRUG TREATMENT ENGAGEMENT AND HIV RISK BEHAVIOR

Drug treatment is potentially a critical HIV prevention strategy. The most effective way for drug users to reduce their risk for contracting HIV through contaminated needles and multiple sexual contacts is to stop using drugs, and if it is not possible, drug users need help to reduce their frequency of injecting, drug use, and engaging in unprotected sex (World Health Organization, 2004). Drug treatment can interrupt HIV transmission by reducing drug-related HIV risk behavior, including frequency of drug use, injection drug use, or sharing of needles/drug equipment. Although not the primary goal, drug treatment programs also have the potential to reduce risk behaviors associated with sexual transmission of HIV, such as sexual activity triggered by disinhibition or other drug effects, and engaging in sex in exchange for drug or money (Sorenson and Copeland, 2000). However, the full benefits of drug treatment may not be experienced if the individual does not engage in the drug treatment process.

Drug treatment engagement is the process of developing a trusting relationship between a counselor and client and adhering to the treatment process. The counselor establishes regular

contact and a helpful relationship with the client in order to foster recovery from drugs and alcohol (Simpson, 2004). Drug treatment engagement is measured primarily by program participation and the formation of a therapeutic relationship with an assigned counselor (counseling rapport). Program participation can include individual and group therapy session attendance as well as assessments of psychological engagement in these sessions. The therapeutic relationship is believed to be the crux of effective drug treatment (Simpson, 2004). In many states, federal guidelines are in place to ensure that clients are receiving quality drug treatment services.

Specifically, federal law requires that all methadone maintenance programs provide adequate medical, counseling, vocational, educational, and other assessment and treatment services. Under the counseling mandate it is required that methadone programs provide counseling on preventing exposure to, and transmission of, HIV disease for each patient admitted or readmitted to maintenance or detoxification treatment. Additionally, it is mandated that all methadone programs provide substance abuse counseling. This counseling has to be provided by qualified counselors that have the ability to assess the psychological (such as depression) and sociological background of client in order to contribute to the appropriate treatment plan for the client and to monitor client progress (Federal Register, 2001). The requirements of federal drug treatment policies are central to the variables of the present study: assessment of psychological background of patient (i.e., depression, anxiety, hostility), treatment engagement (effective counseling--methadone treatment), and HIV risk assessment.

Past research suggests that drug treatment engagement is a significant predictor of HIV risk behavior. More specifically, studies of methadone clients have found that higher levels of drug treatment engagement significantly predicted lower levels of injection drug use, heroin use,

alcohol and cocaine use, all of which are known drug-related HIV risk factors (Simpson, Joe, Rowan-Szal, & Greener, 1995; Simpson, Joe, Rowan-Szal, & Greener, 1997; Joe et al., 2001). Another study that examined the association between counseling rapport and drug abuse treatment outcomes among 354 clients in community-based nonprofit programs and 223 private for-profit program clients found that lower levels of rapport during treatment predicted worse treatment outcomes, including more cocaine use and criminality (i.e., selling drug, theft, prostitution) both by itself and after adjustment for length of time in treatment and treatment satisfaction (Joe et al., 2001).

3.0 THEORY

3.1 AIDS RISK REDUCTION MODEL (ARRM)

The AIDS Risk Reduction Model (ARRM), is a widely used theorectical framework that attempts to explain and predict behavior change efforts of individuals in relationship to sexual and injection drug use transmission of HIV/AIDS. A three-stage model, the ARRM is derived from previous models that examine social psychological problem solving, and incorporates several variables from other behavior change theories, including the Health Belief Model, self-efficacy theory, emotional influences, and interpersonal processes. The three stages of the ARRM include: 1) recognition and labeling of one's behavior as high risk, 2) making a commitment to reduce high-risk sexual/drug use contacts and to increase low-risk activities; 3) seeking and taking action (enactment) to obtain these goals (Catania, Kegeles & Coates, 1990).

The ARRM's premise is that to prevent HIV infection, individuals with high-risk behaviors must perceive that their sexual and drug use behaviors as problematic and that their behavior place them at risk for contracting HIV. In addition, the individual must be willing to change behaviors that place them at risk. The change process may require the individual to weigh the benefits of changing the risky behavior against the cost of changing such behavior. Lastly, the individual will need to enact low risk activities. This effort may take several undertakings. The individual may employ solutions through measures of self-help and informal/formal social

support (professional services- i.e., drug treatment). However, barriers that the individual faces such as finances, environmental factors, sexual/drug using partners, and psychosocial barriers may impede these efforts. This overall process (labeling, commitment, and action) may not be unidirectional or nonreversible (Catania, Kegeles & Coates, 1990). For example, drug users may be immensely challenged in changing their drug use behavior, and come to relabel their drug using activities as unproblematic or drug users may reduce their commitment to change. In the case of persons in MMT, individuals may come into drug treatment viewing their situation as problematic but after several relapses individuals may decide that the recovery/treatment process is more difficult than they expected and thus they decide to lower their commitment to MMT ultimately putting them at risk for contracting HIV.

Progression through the ARRM stages is dependent on the influence of several psychosocial factors. These factors are: susceptibility, HIV transmission knowledge, aversive emotional states, social factors, perceptions of enjoyment and risk reduction, self-efficacy, sexual communication skills, and help-seeking behavior (Catania, Kegeles & Coates, 1990). Some of these factors may not be specific to any one stage but are considered to either motivate or hinder movement across the stages of ARRM.

In stage 1 of ARRM, recognition and labeling of one's behavior as high risk (or problematic), is said to be influenced by three factors. The first factor is the individual's knowledge of sexual activities associated with HIV transmission (Catania, Kegeles & Coates, 1990). It is hypothesized that knowledge of drug use activities associated with HIV transmission influences recognition and labeling behavior as high risk. Second, recognition and labeling one's behavior is also influenced by one's perceived susceptibility of contracting HIV. It is hypothesized that individuals must perceive themselves as being at risk for HIV infection in

order for them to change their behavior to lower risk activities (Catania, Kegeles & Coates, 1990). Third, the individual must believe that having HIV/AIDS is undesirable. If the individual does not place value on their health and does not believe that having AIDS is an undesirable health condition the person is less likely to change their behavior than someone whom believes that contracting HIV is undesirable (Catania, Kegeles & Coates, 1990). According to the ARRM Model, when drug users learn that HIV is transmitted by sex and drug use activities (i.e. – unsafe sex, sharing needles, crack pipes, and drug paraphernalia), they examine their behavior, label their behaviors as risky, and as a result feel worried or apprehensive about the behavior and their susceptibility of contracting HIV. When this process occurs, the theory suggests that drug users will label their behavior as problematic and be more likely to make a commit to changing their behavior. However, it should be noted that drug users' sexual and drug using partners may seriously impact their labeling process, leading user to relabel their behavior as being low risk or to use other coping mechanisms such as denial or avoidance to deal with the challenging issue of behavior change (Catania, Kegeles & Coates, 1990).

The second stage of ARRM is based on social cognitive theory. Social cognitive theory posits that human behavior is a triadic, dynamic, and reciprocal interaction of personal factors, behavior, and the environment (Bandura, 1989). In stage 2 of ARRM--commitment to change, drug users decide to make behavioral changes and strongly commit to that decision. This decision making process may yield other outcomes such as indecision, non-action, or continued involvement with the problem behavior. There are several factors that are said to influence goal achievement within this stage and movement unto the next stage. The hypothesized influences are: cost and benefits, enjoyment, response efficacy, and self-efficacy. For example, knowledge of health utility and enjoyability of a sexual or drug use practice, as well as social factors (peer

norms and social support), are believed to influence an individual's cost and benefit and self-efficacy beliefs. Self-efficacy in relationship to this study will examine drug user's confidence in their ability to exert control over injection, drug, and sexual risk taking. In regards to response efficacy, which is central to the Health Belief Model and efficacy theory, this study examines how drug users perceive the effectiveness of adopting safer sex and drug use practices in relationship to reducing their risk of contracting HIV. The degree of commitment that drug users have in adopting safer sex and drug use practices may be increased when those practices are viewed as effective (Catania, Kegeles & Coates, 1990).

The third stage of ARRM--taking action, happens once individuals have made a commitment to reducing high-risk behavior. This stage is composed of three phases, which include information seeking, obtaining remedies, and enacting solutions. An individual may complete phases concurrently or phases may be skipped entirely. For example, drug users may begin to get ideas and solicit the opinions of others on ways to change their high risk behavior or they may move directly to enacting a solution given that the drug user has a family member who is a diabetic (has access to sterile needles) and this family member has agreed to give the drug user their supply of extra needles.

Several factors are said to influence this stage of the model. Social networks and problem-solving choices (self-help, informal and formal support) are said to influence this stage by the fact that people with problems utilize a variety of strategies to solve such problems. For example, drug users may choose to do nothing about their risky behaviors or because of the fact that their behavior is more stigmatized than that of those who do not use drugs, many may be more likely to rely on self-help solutions than informal or formal support. Other factors said to influence the different stages of the ARRM are: prior experiences with problems and solutions,

self-esteem, requirements of acquiring help, ability to communicate verbally with sex and drug using partners, and sex and drug using partner's personal beliefs and behaviors (Catania et al., 1990).

Several studies have used the ARRM to examine HIV risk behavior among injection drug users (Longshore, Stein, & Anglin, 1997; Longshore, Stein, Kowalewski, 1998; Malow et al., 1994). The findings vary in regard to the usefulness of ARRM in explaining risk behavior and change. For example, one study suggests that individuals who believe that their current behavior is risky are more likely to engage in preventive health behavior (Kok et al., 1991). Other studies suggest that perceived risk may decrease the likelihood of an individual adopting/committing to preventive health behavior (Robels et al., 1995; Malow et al., 1994). Furthermore, some studies have suggested that the self-efficacy construct of the model actually predicts rather than prevents injection risk behavior (Kok et al., 1991; Longshore et al., 1997).

In addition to the stages listed above, the developers of the ARRM identified other internal and external factors that may motivate individual movement across the three stages. For instance, aversive emotional states (e.g., depression or alcohol and drug use that blunt emotional states) may facilitate or hinder the labeling of one's behaviors. Leith & Baumeister (1996) suggest that the self-regulatory processes (one's ability to monitor, direct, and alter one's thoughts, feelings, and actions) may be disrupted when an individual experiences psychological problems such as depression, anxiety, and hostility. Furthermore, a study conducted by Beck (1967) suggested that individuals who are upset or depressed may engage in a pattern of destructive thoughts, which may reduce motivation to care for themselves and lead to behaviors (e.g., drug use, risky sex) that may compromise their personal health.

Moreover, studies have suggested that some psychological problems are so unpleasant to deal with that the discomfort experienced may cause individuals to take actions to alleviate that state (Morris & Reilly, 1987). According to McKirnan et al. (1996) the idea of practicing safe sex or not using drugs may be in conflict with the idea of alleviating depression, because this type of self-regulation often takes the form of satisfying and pleasure-seeking conduct (i.e., unsafe sex and drug and alcohol use) due to the individual trying to divert his or her attention away from the negative feelings associated with the psychological problem. Conversely, there are other theoretical views and empirical findings that suggest that psychological problems may be associated with decreased HIV sexual and drug risk behavior due to the fact that the individual may be extremely psychologically (e.g., manic depression) impaired and does not have any desire to have sex or use drugs (Schwarz, 1990; Frijda, 1988).

The studies mentioned above and others have examined the cognitive and behavioral factors that may impact HIV risk behavior. However, attempting to understand HIV risk by focusing only on rational processes may minimize irrational or psychological problems that may promote risky sex and drug use. As mentioned earlier, depression has been shown to impede the adoption of protective health factors (Orr et al., 1994). Individuals who are psychological impaired may be less motivated to take action (Stein et al., 2003). The ARRM states that individuals must be motivated in order to take action, and if not, the individual remains at risk. Therefore, in the case of this model I am interested in exploring whether drug users with elevated levels of psychological dysfunction may be less likely to adopt or have lower levels of protective health behavior (i.e., effective drug treatment engagement--abstinence/reduction in drug use, safer sex, or safer needle practices) and/or view the protective health behavior as less meaningful. Consequently, this lower protective health behavior potentially places the drug user

at a risk for higher levels of HIV risk behavior (continued drug use, unsafe sex, and unsafe needle practices).

In this model, health related change occurs specifically when an individual has interest in and concern about the prevention strategy. An individual, whose health beliefs oppose those that support for example, methadone maintenance treatment, is less likely to achieve long-term abstinence from drug use, which may expose the individual to risky HIV behavior. Additionally, this model states that aversive emotional state such as depression may impede the adoption of preventive health behavior. For example, several studies suggest that a significant relationship exist between depression and HIV risk behavior- injection drug use (Brooner et al., 1997; Regier et al., 1990; Ross et al, 1988; Rounsaville et al, 1982).

Additionally, dysthymic disorder, a low grade form of depression, characterized by flat affect, low energy and motivation, fluctuations in overall mood and chronic pessimism may have an effect on an individual's capacity to adopt protective HIV behavior (American Psychiatric Association, 2000). Individuals with such symptoms may continue with methadone treatment (appear for medication services-take methadone), but low motivation may prevent the individual from actively engaging in treatment (i.e., talking about feelings, learning how to analyze and solve problems, reducing drug use, and attending counseling sessions).

Chronic pessimism may also hinder the individuals' ability to trust his or her counselor, which is essential to establishing the foundation of counseling rapport. Additionally, pessimism may also affect how the individual perceives his/her ability (self-efficacy) to make positive change (i.e., quitting drug use, not sharing needles, practicing safe sex methods); the individual may believe that they have no or little self-efficacy. Bandura (1990) suggests that an individual's perceived ability (self-efficacy) to successfully carry out a health action such as not sharing

needles or using a condom every time one engages in sex, greatly influences the individuals decision and ability to enact and sustain a changed behavior. The items mentioned above (treatment participation and counseling rapport in relation to motivation and pessimism) are two items that are central to drug treatment engagement, in this study. Drug treatment engagement has been found to predict the progress of individuals in drug treatment. Severity of psychological problems are often a barrier to effective treatment engagement and drug treatment outcomes among individuals enrolled in drug treatment (Simpson, 2004).

3.2 CONCEPTUAL FRAMEWORK

The present study seeks to examine the effects of psychological dysfunction, drug treatment engagement, and HIV risk attitudes on HIV risk behavior. The conceptual framework for this study is directed by the AIDS Risk Reduction Model. As indicated in the previous section, Catania et al. (1990) suggest that internal and external factors may motivate or hinder an individual's movement across the 3 stages of the model. Aversive emotional states (e.g., depression, anxiety, hostility, or alcohol and drug use that blunt emotional states) may hinder the labeling of one's behaviors as risky. Based on the addiction literature and the review of the literature, there is a well-developed body of work regarding the predictors of HIV risk behaviors among drug users. There is sufficient evidence to suggest that higher levels of psychological dysfunction are associated with HIV risking behavior in drug users (Camacho et al., 1996; Darke et al., 1994; Woody et al. 1997). Increased levels of psychological dysfunction may hinder individuals from labeling their behavior as risky and may hinder the individual from moving across the different stages of this model.

Additionally, research suggests that a relationship exists between drug treatment engagement and drug relapse (i.e., injection and non-injection drug use). Drug relapse may place an individual at risk for contracting HIV (Simpson, 2004). Engaging in drug treatment may motivate the individual to label their behavior as risky allowing the individual to potentially move across the stages of the model. Although not the primary goal, engaging in drug treatment also has the potential to reduce risk behavior associated with sexual transmission of HIV, such as sexual activity triggered by disinhibition brought on by alcohol use or other drug effects, and engaging in sex in exchange for drug or money (Sorenson and Copeland, 2000). Accordingly, in this study I treat level of drug treatment engagement as a predictor of HIV risk behavior. Although relatively few studies have explored the impact of drug treatment engagement on HIV risk behavior, the limited research suggests that drug treatment is significantly related to reduced opiate drug use and to HIV risk behavior (injection frequency) (Marsch, 1998; Ball, et al. 1991). Based on the conceptual framework and the literature review conducted for this study, I will examine the following questions:

1. How prevalent are psychological disorders (anxiety, depression, and hostility) and HIV risk behavior among an urban of sample of methadone clients?
2. What is the bivariate relationship between level of psychological dysfunction (anxiety, hostility, and depression) and level of HIV risk behavior (injection drug use, non-injection drug use, and sexual risk)?
3. What is the bivariate relationship between treatment engagement (counseling rapport, treatment satisfaction, and treatment participation) and HIV risk behavior?
4. What is the bivariate relationship between HIV risk attitudes and HIV risk behavior?

5. What is the bivariate relationship between treatment engagement and psychological dysfunction?
6. Which combination of psychological problems (anxiety, depression, hostility) and treatment engagement (counseling rapport, treatment satisfaction, and treatment participation) best predict the amount of HIV risk behavior among methadone clients?
7. What variables in the different stages of the ARRM Model best predict HIV risk behavior?
8. Are clients with higher levels of psychological dysfunction less likely to engage in the drug treatment process, consequently, do they have higher levels of HIV risk behavior than those with lower levels of psychological dysfunction?
9. Are clients with higher levels of psychological dysfunction more likely to have lower HIV risk reduction attitudes, consequently, do they have higher levels of HIV risk behavior than those with lower levels of psychological dysfunction?

Many of the research questions posed are based on the ARRM framework presented above. Accordingly, I focus in on the notion that drug-abusing populations have increased rates of psychological problems, which has been shown to impede the adoption of protective health behavior (Orr et al., 1994). As mentioned earlier, individual who have psychological problems may be less motivated to take action. This model explicitly states that individuals must be motivated in order to take action and, if not, the individual remains at risk. This model assumes that individuals have control over their behavior and that health action depends on their attitudes and beliefs, which may not be the case if an individual is suffering from a psychological problem. Therefore, in the case of this model I am arguing that psychological problems (hostility, depression, and anxiety) may help in explaining HIV risk behavior among methadone

maintained clients. Specifically, I will explore whether clients with higher levels of psychiatric problems (psychological dysfunction) are less likely to engage or have lower levels of engagement in the protective health action (drug treatment engagement--methadone maintenance treatment) or view it as less meaningful. Consequently, does lower engagement put the client at a risk for higher levels of HIV risk behavior (continued drug use, unsafe sex, and unsafe needle practice). The conceptualized relationship between the central study variables are show in figure 1.

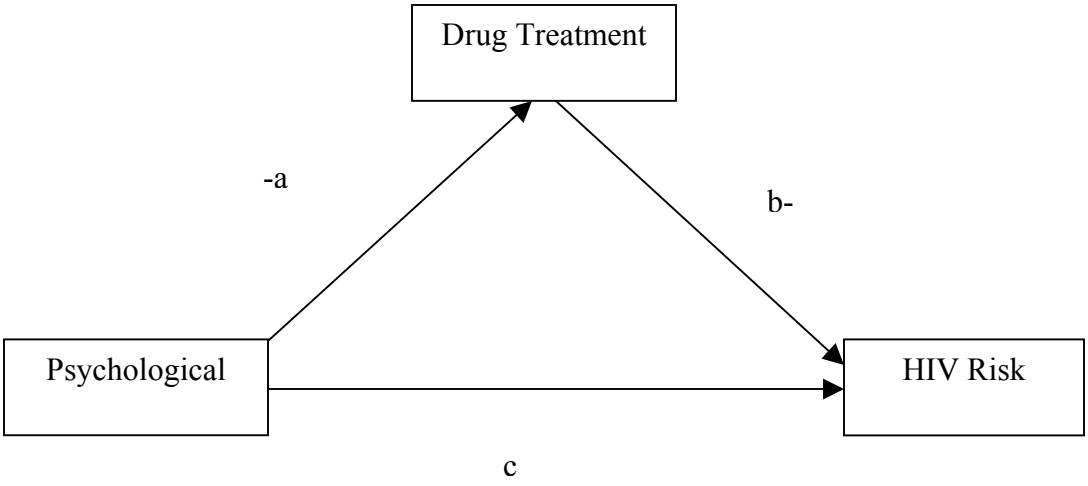

Figure 1. Conceptual Model

4.0 METHODOLOGY

4.1 PARTICIPANTS

This study utilized a cross-sectional design to explore the relationship between psychological dysfunction, drug treatment engagement, HIV risk attitudes, and HIV risk behavior in a convenience sample of methadone maintenance clients from a large regional drug treatment facility located in Pittsburgh, PA. This treatment facility has been providing comprehensive care for chemically dependent people for 38 years. It offers a variety of services in two locations; however data were only collected from their main treatment site. The criteria for recruiting participants who were eligible for the study was as follows: 1) currently enrolled in methadone treatment for a minimum of 90 days 2) at least 18 years of age, 3) have injected illicit drugs or used non-injection drugs during the past 90 days, 4) able to read and speak English fluently.

Participants completed a self-administered closed-ended questionnaire that measured the severity of psychological problems (depression, anxiety, and hostility), drug treatment engagement, HIV risk attitudes, HIV risk behavior, and demographic information. The design, sample, and selection criterion of the study was approved by the Institutional Review Board (IRB) of the University of Pittsburgh prior to the start date of the study (See Appendix A). I recruited 200 clients to analyze the relationship between psychological dysfunction and HIV risk behavior.

4.2 METHODS AND PROCEDURES FOR DATA COLLECTION

After gaining approval from the IRB of the University of Pittsburgh, the survey was conducted at the methadone maintenance treatment facility. The study was conducted based on pre-arranged dates suggested by the treatment facility director. Study descriptions were sent to the HIV counselor at the treatment facility two weeks before the study began so that the counselor could inform the clients about the nature and purpose of the study before it took place. The study description emphasized participant confidentiality and the voluntary nature of the study. Additionally, the description explained the purpose of study, when the study would take place, and that the researcher needed to collect sensitive information regarding drug treatment experiences, drug use, and sexual activity. The study description informed the potential participants to contact the researcher if they were interested in more information pertaining to the study.

The HIV counselor at the methadone treatment facility assisted in the recruitment process by passing out research study flyers and by assisting with the administration of the survey. Additionally, participants were recruited into the study by having several different designated days and times (approved by treatment facility) were I could be on site at the treatment facility for recruitment and administering the survey. This was done to avoid selection bias that may have occured if I was only on site during the times when the early clients arrived. The treatment facility administers services from 6:00 a.m. - 1:45 p.m. Monday through Saturday.

The participants were informed that methadone treatment services were not connected to participating in the research study. All potential participants were screened for eligibility. If the individual was found to be eligible, they were given a verbal and written description of the study. After going over the description of the study and getting verbal consent, the self-administered

pencil-and-paper survey was conducted in a separate private location at the treatment facility. This was done to decrease the possibility that the researcher's presence would coerce the respondent to answer in a more socially desirable or acceptable way and to allow for complete privacy due to the sensitive nature of the research questions. Additionally, participants were assessed to see if they were experiencing any confusion, stress, physical discomfort or worry from the survey procedure. I was also available to assist the participants to interpret the questionnaire and to assure participants that their confidentiality would not be compromised.

The benefit to utilizing a pencil-and-paper survey is that the research participants were able to complete the survey at their own convenience, giving them time to consider their responses. Participants were also afforded complete confidentiality-offering them the greatest opportunity to be fully truthful in their responses (when an interviewer is present, research participants may not disclose their true feelings if the topic is sensitive). The survey specifically asked participants to be open and honest with their responses due to the highly personal nature of questions. Participants were reminded that the survey was completely confidential and that their names or client ID numbers were not to be placed on survey in order to protect their confidentiality. The complete questionnaire and recruitment letter is included in Appendix B.

After successful completion of the survey each participant was given $5.00 for his or her participation. This incentive was noted in the written description given to the participant at the beginning of the survey.

4.3 STUDY VARIABLES AND MEASUREMENT

The study adapted measures from various previous studies. The Texas Christian University (TCU) Self-Rating Form (TCU/SRF; Simpson 1992); The Texas Christian University (TCU) Client Evaluation of Self and Treatment (TCU CEST; Joe et al., 2002); The HIV Risk-Taking Behavior Scale (HRBS; Darke et al., 1991); The HIV/AIDS Risk Assessment Form (ARA; Simpson, 1998); AIDS Risk Reduction Measure (ARRM; Longshore et al., 1998) and a demographic measure.

4.3.1 Texas Christian University (TCU) Self-Rating Form

The Texas Christian University (TCU) Self-Rating Form (Psychological and Social Functioning Domains) was used to assess three aspects psychological functioning: depression, anxiety, and hostility **(independent variables)**. Psychological functioning is an important consideration in drug abuse intervention strategies (Simpson, 1992). Psychological functioning has been found to be related to coping with health threats (Ostrowe et al., 1989; Joe et al., 1991). Poor social functioning has also been found to relate negatively to drug treatment engagement and retention in drug treatment (Joe et al., 1999; Broome et al., 1999).

The Depression Scale of the TCU/SRF consists of six items that are conceptually similar to many items of the Beck Depression Inventory (Beck & Steer, 1987) and the Symptom Checklist-90 (SCL-90) (Derogatis et al., 1973). The Depression scale of TCU/SRF has had a history of a relatively high alpha reliability coefficient of .87 (Joe et al., 2002; Myers et al., 1991; Simpson et al., 1992; Simpson, 1991; Simpson et al., 1993). In addition, the TCU/SRF depression scale score has been found to be highly correlated with the SCL-90 depression scale

(r=.81, Myers et al., 1991) and the Beck Depression Inventory (r=.75, Simpson et al., 1992). Preliminary evidence has also found a test-retest reliability coefficient of .86 (Simpson, 1991). Item-total correlations have also been acceptable (Joe et al., 1991).

The Anxiety Scale of the TCU/SRF consists of seven items and is similar conceptually to those of the Hamilton Anxiety Scale and the Anxiety Scale from the SCL-90. Prior research with the TCU/SRF Anxiety Scale has demonstrated good psychometric characteristics. For example, one study found a reliability alpha coefficient of .83 for this particular scale (Simpson et al., 1993). In addition, a test-retest reliability coefficient of .84 was found with a sample of 44 substance abusing probationers tested 8-10 days apart (Simpson, 1991). In addition, the TCU/SRF Anxiety Scale score has been found to be highly correlated with the SCL-90 anxiety scale score (r=.74, Myers et al., 1991). Finally, all TCU/SRF Anxiety Scale items have consistently demonstrated acceptable item-total correlations and individual item distributions have been relatively normal.

The Hostility Scale of the TCU/SRF has eight items and has continually had good psychometric properties across multiple studies. For example, coefficient alpha reliabilities have been found to be above .75, and a principal components analysis confirmed its unidimensionality (Simpson & Joe, 1993; Simpson, 1991). A test-retest reliability coefficient of .88 was found with a sample of 44 substance abusing probationers tested 8-10 days apart (Simpson, 1991). In addition, the TCU/SRF hostility scale has been found to be correlated with the SCL-90 hostility scale score (r=. 61, Myers et al., 1991).

All of the scales mentioned above (depression, anxiety, hostility) are rated on a 5-point scale from 1 = “Strongly Disagree” to 5 = “Strongly Agree”. Scores for each scale are obtained by summing the responses to its set of items (after reverse scoring where appropriate), dividing

the sum by number of items included (yielding and average) and multiplying the total by10 in order to rescale final scores to get a range between 10 and 50 (e.g., an average response of 2.6 for a scale would become 26). Higher scores indicate higher level of psychological dysfunction on the particular psychological problem being measured. This instrument can also yield an overall score of psychological dysfunction (Simpson, 1991).

4.3.2 HIV Risk-Taking Behavior Scale/ HIV/AIDS Risk Assessment

Items taken from the HIV Risk-taking Behavior Scale, the HIV/AIDS Risk Assessment, and items that I created were used to assess HIV sexual and drug risk behavior **(dependent variable)** among the research participants. I asked participants to respond to thirty-nine items that measured both drug use and sex risk in the past 3 months. This measure is divided into three subscales: injection drug use (7-items), non-injection drug use (15-items that I added), and sexual behavior (17-items -2 added that I added). The Texas Christian University HIV/AIDS Risk Assessment developed by Simpson, 1997 (alpha coefficient >.70) and from the HIV Risk-taking Behavior Scale (alpha coefficient =. 70; test-retest reliability (one week) = .86 developed by Darke et al. in 1991. The new scale was created by combining items from both scales and by including additional items of risk that are characteristic of this population (i.e., frequency of being diagnosed with an sexually transmitted disease, frequency of non-injection drug use, and where individuals typically get their needles). In addition, I modified the scoring of the instrument so that all items were measured and scored in the same metric. From a pilot study conducted by the researcher in 2005 with 100 methadone clients the new scale yielded the following coefficient alphas: injection drug use subscale (7-items), non-injection drug use (15-

items) and the sexual behavior subscale (17-items) had coefficient alphas of .70, .75, and .70 respectively with the overall scale having a coefficient alpha of .80.

To obtain a score for this scale, each subscale was sum scored. This scale provides 4 scores: a total score indicating overall level of HIV risk behavior; an injection drug use score indicating the level of risk due to injection drug risk, a non-injection drug use score indicating the level of risk due to non-injection drug use behavior, and a sexual behavior score indicating the level of risk associated with unsafe sexual practices. In all cases the higher the score, the greater the risk the participant has of contracting/transmitting the HIV virus. Behaviors are rated on a 6-point scale according to number of times a behavior occurred, number of people involved in the behavior, and according to the frequency of occurrence (0= "No times or None " to 5= "More than 10 people or more than 10 times "). The specific wording of the items are as follows: "How many times have you injected drugs in the last 3 months?" (Injection Drug Use Behavior), "Not counting the drugs you injected, how many times did you use crack cocaine in the last 3 months?" (Non-Injection Drug Use Behavior), and "How many times did you have sex without a condom with someone who shoots drugs with needles in the last 3 months?" (Sexual Behavior).

4.3.3 AIDS Risk Reduction Measure

Attitudes toward HIV/AIDS risk behavior were assessed utilizing the AIDS Risk Reduction Measure. The ARRM is comprised of 40-items and assesses participant attitudes and concerns about HIV/AIDS and the ways in which individuals can become infected with HIV/AIDS. These items are relevant to the psychosocial constructs of the ARRM. The following constructs were assessed: AIDS knowledge (10-items), perceived susceptibility (2- items), perceived infection

risk (2-items), response efficacy (4-items), perceived self-efficacy (7- items), intended risk reduction (5-items), motivating factors- fear (1-item), peer norms (6-items) informational cues to action (3-items) and interpersonal cues to action (2-items). The specific wording of the items are as follows: "HIV only affects gay men" (HIV knowledge), "I never do anything that could give me HIV" (perceived susceptibility), " I am not worried about passing HIV to others" (perceived risk of infection), "Using condoms can reduce the chance of getting HIV" (response efficacy) , "I'd rather get dope sick (withdrawal) than share works" (perceived self-efficacy), "in the year ahead I will share works" (intended risk reduction), "HIV/AIDS is the most frightening disease I know (fear), "My friends are not using condoms when they have sex" (peer norms), "Have you ever had face-to-face HIV education in the past year?" (informational cues), "How many people do you know personally who have been infected with HIV/AIDS?" (interpersonal cues). Using a Likert-type scale ranging from (1) strongly agree to (4) strongly disagree items are summed scored with higher scores indicating a higher level of the construct being measured. For informational and interpersonal cues items were scored with yes or no responses of number of friends/family known to be HIV positive or have died of AIDS. Higher scores indicate stronger cues to action.

4.3.4 Client Evaluation of Self and Treatment

For the purpose of this study, drug treatment engagement is defined as a process of developing a trusting relationship between a counselor and client. It is a process whereby the counselor establishes regular contact and a helpful relationship with a client in order to foster recovery from drugs and alcohol (Simpson, 2004). In addition, drug treatment engagement is measured

primarily by program participation and the formation of a therapeutic relationship with an assigned counselor (counseling rapport).

Drug treatment engagement was measured using the TCU Institute of Behavioral Research Client Evaluation of Self and Treatment-Therapeutic Engagement Domains (CEST; Joe et al., 2002). The Therapeutic Engagement Domain of CEST measures drug treatment performance in relationship to drug treatment engagement. This 33-item scale is intended to measure 3 subscales related to: (1) treatment satisfaction (7-items), (2) counseling rapport (14-items), and (3) treatment participation (12-items). Item examples are: "I am satisfied with this program" (treatment satisfaction), "I trust my counselor" (counseling rapport), and "I am following my counselor's guidance" (treatment participation). Using a Likert-type scale items are rated on a 5-point Likert type scale ranging from 1= "Strongly Disagree" to 5= "Strongly Agree" on how participants feel about treatment progress, rapport and relationship with their primary counselor, treatment satisfaction, and participation in the therapeutic process.

Scores for each of the subscales are obtained by summing responses to the set of items (after reversing scores on reflected items by subtracting the item response from "6"), dividing the sum by number of items included (yielding an average) and multiplying by 10 in order to rescale final scores so they range from 10 to 50 (e.g., an average response of 2.6 for a scale becomes a score of "26") (TCU, 2005). Higher scores indicate more confidence in the particular factor being measured. These scales have been shown to be reliable and valid with a national sample of over 1500 clients from 87 programs with subscale coefficient alphas ranging from .86 to .96 (Joe et al., 2002). From a pilot study that I conducted in 2005 with 100 methadone clients the CEST (Therapeutic Engagement Domain) yielded the following coefficient alphas: treatment

satisfaction α= .79, counseling rapport α= .93, and treatment participation α =.89. The scores were normally distributed across this measure.

4.3.5 Control Variables and Demographic Information

In addition to the central study variables, a number of other variables, related to both the independent and dependent variables, were controlled. The following items were included as control variables in the study: current age, sex, race/ethnicity, and length of time in current treatment setting. Other demographic information was collected for descriptive purposes: marital status, level of education, current employment status, financial status, household composition, past drug treatment participation, and number of times in drug treatment.

4.4 DATA ANALYSIS STRATEGY

I used SPSS 11.5 statistical software to analyze the data. All data were first entered into a codebook followed by the naming and coding of each variable. To assist in the data cleaning process I examined frequency distributions and percentages for all variables. Additionally, measures of central tendency, dispersion, and distribution were obtained for the central study variables.

Descriptive statistics/analyses were conducted to describe the sample's demographic and key study variables. Specifically, descriptive statistics were utilized to answer the following question:

1. How prevalent are psychological disorders (anxiety, depression, and hostility) and HIV risk behavior among an urban of sample of methadone clients?

Bivariate correlations statistics were used to assess the relationships among the study variables. Specifically, I calculated Pearson's correlations (p=.05) to answer the following questions:

2. What is the bivariate relationship between level of psychological dysfunction (anxiety, hostility, and depression) and level of HIV risk behavior?
3. What is the bivariate relationship between level treatment engagement and HIV risk behavior?
4. What is the bivariate relationship between HIV risk attitudes and HIV risk behavior?
5. What is the bivariate relationship between treatment engagement and psychological dysfunction?

Multiple regression analyses were used to answer the following question:

6. Which combination of psychological problems (anxiety, depression, hostility) and treatment engagement (counseling rapport, treatment satisfaction, and treatment participation) best predict the amount of HIV risk behavior among methadone clients?
7. What variables in the different stages of the ARRM Model best predict HIV risk behavior?
8. Are clients with higher levels of psychological dysfunction less likely to engage in the treatment process, consequently, do they have higher levels of HIV risk behavior than those with lower levels of psychological dysfunction?
9. Are clients with higher levels of psychological dysfunction more likely to have lower HIV risk reduction attitudes, consequently, do they have higher levels of HIV risk behavior than those with lower levels of psychological dysfunction?

To produce the best combination of predictors of the dependent variable, I used standard multiple regression along with a sequential regression model in which I selected independent variables, one at a time, by their ability to account for the most variance in the dependent variable. As each independent variable was entered into the group of predictors, the relationship between the group of predictors and the dependent variable was reassessed. When no variables were left that explained a significant amount of variance in the dependent variable, the regression model was considered complete. I used this strategy to predict the best combination of independent variables for each subscale of the dependent variable (injection drug use, non-injection drug use, and sexual risk behavior) and the overall measure of HIV risk behavior.

5.0 RESULTS

This chapter presents the findings from the analyses of data collected on 200 methadone treatment clients in Pittsburgh, PA. These clients were all enrolled in treatment at least 90 days prior to the start date of data collection at their treatment facility. The first section presents a summary of the demographic characteristics of the sample, followed by a presentation of bivariate and multivariate findings related to the nine research questions that guided the study.

5.1 DESCRIPTIVE INFORMATION

5.1.1 Background Characteristics

Table 1 shows the demographic characteristics of the 200 respondents. The age of the participants ranged from 20 to 69. The mean age was 42.55 years (SD=11.78). Of the 200 participants, 41.5% (83) were female and 58.5% (117) were male. Consistent with the population of the treatment center, more than half of the participants were Caucasian (117; 58.5%), 39.5% were African American (79), 2% were Hispanic (4), and 0.5% (1) of the participants reported other to describe themselves racially.

About 27% (54) of participants were currently married (legally married and common law marriage), 47.5% (95) were never married, 21% (42) either separated (10.5 %) or divorced

(10.5%), and 4.5% (9) were widowed. About 40% (79) of the participants reported living with family or other relatives, 28.5% (57) reported living with a boyfriend/ girlfriend, 23.5% (47) reported living alone, and 7% (14) reported that they were either homeless (2.5%), living with a group of friends/friend (4%), or hospitalized or living in a rehabilitation center during the past 90 days prior to the study (0.5%). More than half 56% (112) finished high school, 24.5% (49) had some college experience, 5.5% (11) completed college, and 3% (6) had completed a graduate or professional degree. Almost one-third (53) of the sample had some type of legal problem (i.e., probation, parole, awaiting sentence, warrant, or pending case).

Of the 200 participants, 27.5% (55) reported that they were employed and 72.5% (145) reported being unemployed. Only 166 participants reported their income. Nearly half (49.4%) of the participants reported income under $8000, while 12% reported no income for the prior year. The mean income for this sample population was $11,576 (SD=$12,760). When participants were ask what their sources of support were for the prior year, 56.5% (113) reported welfare, public assistance, or disability, 35% (70) reported job, 17.5% (35) family/friends 16.5% (33) mate/spouse, 15% (30) selling drugs/other illegal activities, 11.5% (23) unemployment, 5% (10) prostitution and 1.5 % (3) retirement income.

Of the 200 participants in the study, 95% (190) had attended outpatient drug-free treatment prior to attending their current treatment program. Other types of treatment programs attended by participants were partial hospitalization 25% (50), inpatient drug treatment 44.5% (89), residential drug treatment 34% (68), and detoxification 58% (116). The average length of time in current drug treatment program for this sample was 33.74 months (SD= 33.78). About 68% (136) of the sample had between 1-4 treatment experiences prior to attending treatment at

their current treatment program, while 16.5% (33) had 5 or more other treatment experiences. Fifteen percent (31) of the sample had no prior treatment experience.

Table 1. Demographic Characteristics of Participants (N=200)

Variables	Frequency	Percent	M	SD
Age	198 Min. =20 Max.=69		42.55	11.78
Gender				
Male	117	58.5		
Female	83	41.5		
Race				
White	116	58.0		
Black	79	39.5		
Hispanic/Other	5	2.5		
Marital Status				
Never Married	95	47.5		
Legal Married	34	17.0		
Common Law	20	10.0		
Divorce/Sep.	42	21.0		
Widowed	9	4.5		
Living Arrangements				
Family/other relat.	79	39.5		
Boyfriend/Girlfriend	57	28.5		
Live Alone	47	23.5		
Homeless/other	14	7.0		
Education				
Less than 12th grade	22	11.0		
High school	112	56.0		
Some Collete	47	23.5		
College	11	5.5		
Graduate	6	3.0		
Employment Status				
Employed	55	27.5		
Not employed	145	72.5		
Income	166		$11,576	$12,761
Legal Status				
None	139	69.5		
Probation	32	16.0		
Case Pending	13	6.5		
Awaiting trial/other	8	8.0		
Length of time in Tx	200		33.74	33.78
Sources of fin. Support				
Welfare/Disability	113	56.5		
Job/unemployment	93	46.5		
Mate/Spouse	33	16.5		
Family/Friends	35	17.5		
Illegal Activities	51	25.5		

Note: There is missing information for some variables so totals are not all 200.
Dichotomous variables were coded as follow: Gender: 1 = female, 2 = male; Employment: 1 = not employed, 2 = employed.

5.2 DESCRIPTIVE AND PSYCHOMETRIC FINDINGS OF STUDY VARIABLES

The data from this sample were evaluated for accuracy of entry, normality of distribution, and outliers. Values for all of the study variables were verified to make certain that they fell within the possible range upon which the measures were based. Skewness and kurtosis of each measure were reviewed to detect whether they were in an acceptable range of ± 1.0. In this section, the mean, standard deviation, skewness, and kurtosis of the measures are reported. These data are summarized in Table 2.

Table 2. Mean, Standard Deviation, Skewness, and Kurtosis of the Instruments

Instruments	Mean	SD	Skewness	Kurtosis
Psychologic Dys.	**80.5**	**21.57**	**.01**	**.05**
Anxiety	31.33	10.36	-.32	-.83
Hostility	23.43	10.12	.43	-.58
Depression	25.75	8.89	.24	-.57
Treatment Engage.	**108.98**	**23.19**	**-.54**	**.35**
Treatment sat.	34.80	9.55	-.48	-.21
Counseling rapport	36.90	8.89	-.60	.23
Treatment participation	37.28	8.53	-.98	1.05
HIV Risk Behavior	**36.04**	**23.00**	**1.23/.41***	**1.72/-03***
Sex Risk	15.06	12.14	-1.01	-1.37
Non-Injection	15.81	9.46	-.85	.49
Injection Risk	5.17	5.85	1.08	-.78
HIV Knowledge	7.41	1.84	-.74	.18
Informational Cues	2.35	.84	-1.30	1.18
Interpersonal Cues	1.17	.90	-.34	-1.67
Perceived Susp.	5.43	1.43	-.29	.08
Perceived Risk	5.10	1.46	-.17	-.21
Response Efficacy	11.95	2.12	-.11	-.19
Self-Efficacy	19.81	3.24	.41	.14
Intended Risk Red.	14.23	2.78	.10	-.36
Peer Norms	15.59	2.51	-.90	.07
Fear	3.31	.80	.44	1.04

*HIV risk behavior was transformed utilizing the square root method.

5.2.1 Psychological Dysfunction

Twenty-one items from the psychological/social functioning domains of the CEST were used to assess psychological dysfunction which is intended to measure 3 psycho-social subscales related to :(1) depression (6 items), (2) anxiety (7 items), and (3) hostility (8-items). Items were rated on a 5-point Likert type scale ranging from 1= "Strongly Disagree" to 5= "Strongly Agree" pertaining to symptoms relative to psychological or social problem. Higher scores indicate higher level of psychological dysfunction on the particular psychological problem being measured (Simpson, 2001).

5.2.1.1 Depression

The measure for depression consisted of six items that are conceptually similar to many items of the Beck Depression Inventory (Beck & Steer, 1987) and the Symptom Checklist-90 (SCL-90) (Derogatis et al., 1973). Scores for this scale were rated on a 5-point scale from 1 = "Strongly Disagree" to 5 = "Strongly Agree". Higher scores indicate higher level of psychological dysfunction on the depression problem being measured. The mean score in this sample was 25.8 (SD=8.89), suggesting that participants experienced a moderately high level of depressive symptoms/psychological dysfunction during the 90 days prior to the research study. The two highest rated items on the depression scale as identified by participants were, "I feel extra tired or run down" (M=3.18) and "I worry or brood a lot" (M=3.14). The two lowest rating on the depression scale were, "I feel interested in life" (M=2.32) and "I feel hopeless about the future" (M=2.72). Almost half (43%) of the participants stated that they feel sad or depressed.

On the CEST (depression scale), those scoring 30 or higher is considered a problem behavior. The normative mean for drug and alcohol clients is 25.7 (SD=8.0) (Simpson, 2001). In

the present study, the mean depression score was 25.8, a value consistent with the national average score, suggesting that this sample is experiencing the same level of depressive symptoms when compared to other drug and alcohol clients around the United States. Over 75% of the sample experienced moderate to high depressive symptoms. The complete distribution of individual items for the depression subscale can be found in Appendix D, Table 10.

5.2.1.2 Anxiety

The measure for anxiety consisted of seven items that are similar conceptually to those of the Hamilton Anxiety Scale and the Anxiety subscale from the SCL-90. Scores for this scale were rated on a 5-point scale from 1 = "Strongly Disagree" to 5 = "Strongly Agree". Higher scores indicate a higher level of psychological dysfunction on the particular psychological problem being measured. The mean score in this sample was 31.3 (SD=10.36), suggesting that participants experienced a high level of anxiety symptoms during the 90 days prior to the research study. The two highest rated items on the anxiety scale as identified by participants were, "I have trouble sleeping" (M=3.25) and "I feel anxious and nervous" (M=3.12). The two lowest rating on the anxiety scale were, "I feel afraid of certain things" (M=2.66) and "I have trouble sitting still for long periods of time" (M=3.01). Almost half (46.5%) of the participants stated that they have trouble concentrating or remembering things.

On the CEST (anxiety scale), those scoring 30 or higher are considered to be experiencing problems due to the particular problem being measured (anxiety). The normative mean for drug and alcohol clients is 28.1 (SD=8.4) (Simpson, 2001). In the present study, the mean anxiety score was 31.3, a value higher than the national average score, suggesting that this sample is experiencing more symptoms as it relates to anxiety when compare to other drug and alcohol clients around the United States. Over 70% of the sample experienced moderate to high

anxiety symptoms. The complete distribution of individual items for the anxiety subscale can be found in Appendix D, Table 11.

5.2.1.3 Hostility

The measure for hostility consisted of eight items that are similar conceptually to those of the hostility subscale from the SCL-90. Scores for this scale were rated on a 5-point scale from 1 = "Strongly Disagree" to 5 = "Strongly Agree". Higher scores also indicate higher level of psychological dysfunction on the particular psychological problem being measured. The mean score in this sample was 23.4 (SD=10.12), suggesting that participants experienced a moderate level of hostility symptoms during the 90 days prior to the research study. The two highest rated items on the hostility scale as identified by participants were, "I feel a lot of anger inside of me" (M=2.76) and "I have a hot temper" (M=3.14). The two lowest rated items on the hostility scale were, "I like others to feel afraid of me" (M=1.97) and "My temper gets me into fights or other trouble" (M=2.25). Almost one-third (30%) of the participants stated that they have carried a weapon.

On the CEST (hostility scale), those scoring 30 or higher are considered to experiencing problems due to the particular construct being measured. The normative mean for drug and alcohol clients is 24.6 (SD=8.0) (Simpson, 2001). In the present study, the mean hostility score was 23.4. Over 50% of the sample experienced moderate to high hostility symptoms The complete distribution of individual items for the hostility subscale can be found in Appendix D, Table 12.

5.2.1.4 Overall Psychological Dysfunction

The measure for overall psychological dysfunction was comprised of scores from the depression, anxiety, and hostility measures and summing those scores in order to yield an overall score of psychological dysfunction. The mean score in this sample was 80.50 (SD=21.57), suggesting that participants experienced a moderate level of psychological dysfunction during the 90 days prior to the research study. About 60% of the participants experienced moderate to high levels of psychological dysfunction

5.2.2 Treatment Engagement

The 33-item therapeutic engagement domain of the CEST was used to assess treatment engagement which is intended to measure 3 treatment engagement subscales related to :(1) treatment satisfaction (7 items), (2) counseling rapport (14 items), and (3) treatment participation (12-items). Items were rated on a 5-point Likert type scale ranging from 1= "Strongly Disagree" to 5= "Strongly Agree" on how participants feel about treatment progress, rapport and relationship with primary counselor, and treatment satisfaction and participation in the therapeutic process. Higher scores indicate more confidence in the particular factor being measured. Scores above 40 are considered high treatment scores.

5.2.2.1 Treatment Satisfaction

The treatment satisfaction scores in this study ranged from 10 to 50, with higher scores indicating that participants are more satisfied with the treatment that they are receiving from their treatment program. The average treatment satisfaction score for this sample was 34.8 (SD=9.55), which indicates that participants are reasonably satisfied with the treatment that they received

from their treatment program. The two items that participants identified as most satisfying about their treatment program were, “This program expects me to learn responsibility and discipline” (M=3.90) and “I can get plenty of personal counseling at this program” (M=3.79). The two items that participants identified as least satisfying were, “This program location is convenient for me” (M=3.29) and “I am satisfied with this program” (M=3.49).

On the CEST (treatment satisfaction scale), the normative mean for drug and alcohol clients is 37.8 (SD=6.9) (Simpson, 2001). In the present study, the mean treatment satisfaction score was 34.8. The complete distribution of individual items for the treatment satisfaction subscale can be found in Appendix D, Table 13.

5.2.2.2 Counseling Rapport

The counseling rapport scores in this study ranged from 10 to 50, with higher scores indicating that participants have a more solid formation of a therapeutic relationship with his or her assigned counselor. The average counseling rapport score for this sample was 36.9 (SD=8.89), which indicates that participants were moderately engaged in the therapeutic relationship with their counselors. Approximately 80% of the participants answered that their counselor allowed them to give feedback in their treatment plan. In addition, 75% of the participants reported that their treatment plans were reasonable and that talking to their counselors was easy (71.5%).

On the CEST (counseling rapport scale), the normative mean for drug and alcohol clients is 39.6 (SD=6.5) (Simpson, 2001). In the present study, the mean counseling rapport score was 36.9 which is slightly lower than the national average score, but still suggesting that this sample experienced a moderately high level of satisfaction within his or her counseling relationship. The complete distribution of individual items for the counseling rapport subscale can be found in Appendix D, Table 14.

5.2.2.3 Treatment Participation

The treatment participation scores ranged from 10 to 50, with higher scores indicating that participants have more treatment participation. The average treatment participation score for this sample was 37.3 (SD=8.53), which indicates that participants were highly involved in their drug treatment experience. The two highest rating for treatment participation identified by participants were, "I have made progress with my drug/alcohol problem" (M=3.99) and "I have stopped or greatly reduced my use while in this program" (M=3.97). The two lowest ratings for treatment participation that respondents identified were, "I feel comfortable giving negative feedback during counseling" (M=3.52) and "I have made progress with my emotional or psychological issues" (M=3.55).

On the CEST (treatment participation scale), the normative mean for drug and alcohol clients is 40.6 (SD=5.2) (Simpson, 2001). In the present study, the mean treatment satisfaction score was 37.3 which is lower than national average score, suggesting that this sample along with the national sample of drug and alcohol clients are experiencing a moderately high to high rates of treatment participation. The complete distribution of individual items for the treatment participation subscale can be found in Appendix D, Table 15.

5.2.2.4 Overall Treatment Engagement

The measure of overall treatment engagement was comprised by summing the scores from the treatment satisfaction, counseling rapport, and treatment participation subscales of the therapeutic domain of the CEST in order to yield an overall score of treatment engagement. The mean score in this sample was 109.0 (SD=23.19), suggesting that participant were moderately highly engaged in the drug treatment process during the 90 days prior to the research study.

5.2.3 HIV Risk Behavior

The measure for HIV risk behavior consisted of 39 items, which were divided into three subscales: injection drug use (7 items), non-injection drug use (15 items), and sexual behavior (17 items). Scores for these subscale were obtained by summing items that were rated on a 6-point scale ranging from 0= "No times or None" to 5= "More than 10 people or 10 times". This measure provides 4 scores: an injection drug use, a non-injection drug use, a sexual behavior, and a total score indicating the participants overall level of HIV risk behavior. In call cases the higher the score, the greater the risk the participant has of contracting/transmitting the HIV virus.

5.2.3.1 Injection Drug Use Risk

The measure for injection drug use risk consisted of six items that were rated on a 6-point scale ranging from 0 to 5. Scores in this study ranged from 0 to 27, with higher scores indicating more risk as it relates to injection drug use. Almost half (45.5%) of the participants reported injecting drugs once a week or more during the past 3 months. Participants were asked where they got their needle that last time they injected drugs, 42.5% reported that they got their needle from the pharmacy/needle exchange/hospital, 19% from a diabetic family member or friend, 16.5% from drug-using friends, 8.5% from the streets (someone sold it to them), and 5% got needles from a shooting gallery (2.5%) or a friend known to be HIV+ (2.5%). The average injection drug use risk score for this sample was 5.17 (SD=5.85), which indicates that participants were engaging in less risky behavior as it relates to injection drug use. The distribution of individual items for the injection drug use subscale can be found in Appendix D, Table 16.

5.2.3.2 Non-Injection Drug Use Risk

The non-injection drug use risk measure consisted of 13 items that was rated on 6-point scale ranging from 0 to 5. Scores in this study ranged from 0 to 48, with higher scores indicating more risk as it relates to injection drug use. Almost all (97%) of the participants reported that they smoked, snorted, sniffed, or took any drug orally during the 3-month period prior to the study. Drugs most commonly used by participants were: alcohol (54%), xanax/klonopin/valium (prescription medication) (50%), marijuana (45%), heroin (44%), and crack cocaine (43%). Forty- two percent (42%) of the participants reported that they had been drunk one or more times during the 3 months period prior to the study. The average non-injection drug use risk score for this sample was 15.81 (SD=9.46), which indicates that participants were engaging in moderate levels of risky behavior as it relates to non-injection drug use. The distribution of individual items for this scale can be found in Appendix D, Table 17.

5.2.3.3 Sexual Behavior Risk

The sex risk measure consisted of 13 items that was rated on 6-point scale ranging from 0 to 5. The sexual behavior risk scores in this study ranged from 0 to 61, with higher scores indicating more risk as it relates to sexual risk behavior. Approximately 76% of the participants reported that they had sex during the 3-month period prior to the study. Of those that had sex, 22.5% (45) had two or more sex partners, 38% (76) rarely/never used condoms with regular partner, and 16% rarely/never use condoms with causal sex partner. Sexual practices utilized among this sample were: vaginal sex (61%), oral sex (69.5%), and anal sex (18.5%) The average sexual behavior risk score for this sample was 15.06 (SD=12.14), which indicates that participants were engaging in moderate levels of risky behavior as it relates to sex. A common risk factor for contracting HIV is prior infection with a sexually transmitted disease (STD). This study's

findings indicate that 46.5% of the sample had been in infected one or more times with a STD. Ten percent of the sample reported that they had test positive for HIV. The distribution of individual items for the sexual behavior subscale can be found in Appendix D, Table 18.

5.2.3.4 Overall HIV Risk Behavior

The overall HIV risk behavior scores in this study ranged from 4 to 120, with higher scores indicating more risk as it relates to injection drug use, non-injection drug use, and sexual risk behavior. The measure of overall HIV risk behavior was comprised by summing the scores from the injection drug use, non-injection drug use, and sexual behavior risk subscales of the HIV Risk Behavior Scale in order to yield an overall score of HIV risk behavior. The mean score in this sample was 36.04 (SD=23.00), suggesting that participants were engaging in significant amounts of HIV risk behavior during the 90 days prior to the research study.

5.2.4 AIDS Risk Reduction Attitudes

The measure for HIV risk reduction attitudes consisted of 40 items which are consistent with the constructs of the AIDS Risk Reduction Model, a three-stage model, that examine participant attitudes and concerns about HIV/AIDS and the ways in which individuals can become infected with HIV/AIDS. The following constructs were assessed: AIDS knowledge, perceived susceptibility, perceived infection risk, response efficacy, perceived self-efficacy, intended risk reduction, motivating factors- fear, peer norms, informational cues to action, and interpersonal cues to action.

Using a Likert- type scale ranging from (1) strongly agree to (4) strongly disagree items are summed scored with higher scores indicating more of the construct being measured. For

informational and interpersonal cues, items were scored with yes or no responses of number of friends/family known to be HIV positive or have died of AIDS. Higher scores indicate stronger cues action.

5.2.4.1 HIV Knowledge

The measure for HIV knowledge consisted of ten items that were rated on 4- point scale ranging (1) strongly agree to (4) strongly disagree. The HIV knowledge scores in this study ranged from 1 to 10, with higher scores indicating that participants have more HIV knowledge. The average HIV knowledge score for this sample was 7.41 (SD=1.84), which indicates that participants have average knowledge about the risk factors pertaining to HIV/AIDS.

On the ARRM (HIV knowledge scale), the normative mean for similar drug and alcohol clients (N=294) enrolled in methadone treatment is 7.75 (SD=3.5) (Longshore et al., 2004). In the present study, the mean HIV knowledge score was 7.41, which is slightly lower than the score of the comparative sample, but suggesting that this sample has roughly the same HIV knowledge as other clients enrolled in methadone treatment. The distribution of individual items for the HIV Knowledge Scale can be found in Appendix D, Table 19.

5.2.4.2 Perceived Susceptibility

The measure for perceived susceptibility consisted of two items that were rated on 4- point scale ranging (1) strongly agree to (4) strongly disagree. The perceived susceptibility scores in this study ranged from 2 to 8, with higher scores indicating that participants have more perceived susceptibility to contracting HIV. The average perceived susceptibility score for this sample was 5.43 (SD=1.43), which indicates that participants believed that they were reasonably susceptible to contracting HIV/AIDS.

On the ARRM (perceived susceptibility scale), the normative mean for drug and alcohol clients in methadone treatment is 2.75 (SD=.63) (Longshore et al., 2004). In the present study, the mean perceived susceptibility score was 5.43 which is higher than the mean score of the comparative sample, suggesting that this sample perceives that they are more susceptible to contracting HIV than other clients enrolled in methadone treatment. The distribution of individual items for the perceived susceptibility scale can be found in Appendix D, Table 20.

5.2.4.3 Perceived Risk of Infection

The measure for perceive risk of infection consisted of two items that were rated on 4- point scale ranging (1) strongly agree to (4) strongly disagree. The perceived risk scores in this study ranged from 2 to 8, with higher scores indicating that participants perceive themselves to be at a higher risk of contracting HIV/AIDS. In this study, the average perceived risk of infection score was 5.09 (SD=1.46), which indicates that participants believed that they were at a moderate risk of being infected with HIV. The distribution of individual items for the perceived risk of infection scale can be found in Appendix D, Table 20.

5.2.4.4 Perceived Response Efficacy

The measure for perceived response efficacy consisted of four items that were rated on 4- point scale ranging (1) strongly agree to (4) strongly disagree. The response efficacy scores in this study ranged from 6 to 16, with higher scores indicating that participants had more positive beliefs about the efficacy of sexual and drug risk reduction strategies or higher perceived response efficacy. In this study, the average perceived risk of infection score was 11.95 (SD=2.12), which indicates that participants had a moderately high level of belief in the risk

reduction strategies for HIV/AIDS. The distribution of individual items for the perceived response efficacy measure can be found in Appendix D, Table 20.

5.2.4.5 Perceived Self-Efficacy

The measure for perceived self-efficacy consisted of seven items that were rated on 4- point scale ranging (1) strongly agree to (4) strongly disagree. The perceived self efficacy scores in this study ranged from 13 to 28, with higher scores indicating that participants had more positive beliefs about their ability to reduce their sex and drug risk via safer sex and drug use practices. In this study, the average perceived self-efficacy score was 19.81 (SD=3.24), which indicates that participants had a moderate amount of belief in their own personal ability to utilize the HIV/AIDS risk reduction strategies. The distribution of individual items for the perceived self-efficacy measure can be found in Appendix D, Table 20.

5.2.4.6 Intended Risk Reduction

The measure for risk reduction consisted of five items that were rated on 4- point scale ranging (1) strongly agree to (4) strongly disagree. The risk reduction scores in this study ranged from 13 to 28, with higher scores indicating that participants had stronger intention to utilize safer sex and safer drug use practices. In this study, the average risk reduction score was 14.23 (SD=2.78), which indicates that participants had moderately strong intentions to reduce their risky HIV behavior. The distribution of individual items for the risk reduction measure can be found in Appendix D, Table 20.

5.2.4.7 Peer Norms

The measure for peer norms consisted of six items. The peer norms scores in this study ranged from 9 to 24, with higher scores indicating that participant's friends had stronger intentions to utilize safer sex and safer drug use practices. In this study, the average peer norm score was 15.59 (SD=2.51), which indicates that participants perceived that their peers had moderate intentions to reduce their risky HIV behavior. The distribution of individual items for the peer norms measure can be found in Appendix D, Table 20.

5.2.4.8 Cues to Action

Data were collected regarding two possible cues to actions (external motivators). To indicate *informational cues* three yes/no items were utilized to assess whether or not the participant received any face-to- face information regarding HIV/AID education, had been tested for HIV during the previous year, and whether or not the participant had ever receive information from someone encouraging them to get tested for HIV. To measure *interpersonal cues* two items were utilized to assess the number of friends or relatives the participant personally knew that had been infected with HIV and the number of friends or relatives that had died due to HIV disease. Higher scores indicate stronger cues to action.

5.2.4.9 Informational Cues

The informational cues to action scores in this study ranged from 0 to 3, with higher scores indicating that participant had stronger information cues to action. In this study, the average informational cues action score was 2.35 (SD=.84), which indicates that participants had moderately strong cues to action regarding HIV risk reduction efforts. The distribution of

individual items for the informational cues to action measure can be found in Appendix D, Table 20.

5.2.4.10 Interpersonal Cues

The interpersonal cues to action scores in this study ranged from 0 to 2, with higher scores indicating that participant had stronger interpersonal cues to action. In this study, the average interpersonal cues action score was 1.17 (SD=.90), which indicates that participants had moderate interpersonal cues to action regarding HIV risk reduction efforts. The distribution of individual items for the interpersonal cues to action measure can be found in Appendix D, Table 20.

5.2.4.11 Fear (Aversive Emotion)

The fear of HIV/AIDS was measured by one item indicating agreement with a statement regarding HIV/AIDS being the most frightening disease that the participant knows. The *fear* scores in this study ranged from 1 to 4, with higher scores indicating that the participant had a greater fear of HIV/AIDS. In this study, the fear score was 3.31 (SD=.80), which indicates that participants had moderately strong fear regarding HIV/AIDS.

On the ARRM (fear scale), the normative mean for drug and alcohol clients in methadone treatment is 3.0 (SD=.47) (Longshore et al., 2004). In the present study, the mean fear score was 3.31, which is approximately the same as the mean score of the comparative sample, suggesting that both samples have a strong fear of HIV/AIDS. The distribution of individual item for the fear measure can be found in Appendix D, Table 20.

5.3 INFERENTIAL STATISTICAL FINDINGS

5.3.1 Bivariate Analyses

The bivariate relationships for the primary study variables, including the ten background and control variables, are shown in Table 3. It is notable that the three broad outcome variables (HIV risk behavior, psychological dysfunction, and treatment engagement) were significantly related.

Study findings reveal that the four bivariate research questions were significantly confirmed. First, higher levels of psychological dysfunction were associated with higher HIV risk behavior (r=.24, p=.00). When examining psychological dysfunction and specific HIV risk behavior (injection, non-injection, and sexual), analyses show that higher levels of psychological dysfunction is associated with higher injection (r=.16, p=.02), non-injection (r=.21, p=.00), and sex risk (r=.21, p=.00).

However, when examining specific psychological problems (anxiety, hostility, and depression) and HIV risk behavior (injection risk, non-injection risk, and sex risk), analyses show that hostility is positively significantly (+ p<.10, * p<.05, ** p <.01) associated with all types of HIV risk behavior. Correlations coefficients for these associations were .23**, .24**, and .27** respectively, indicating that increased level of hostility is associated with higher injection, non-injection, and sex risk. In addition, analyses also show that depression is significantly associated with non-injection drug risk (r=.14, p=.05) and marginally significant with injection drug risk (r=.12, p=.08) (See Table 4 for bivariate correlations among subscale study variables).

Secondly, the data suggest that there is a significant negative relationship between treatment engagement and HIV risk behavior. Specifically, higher levels of treatment

engagement were associated with lower levels of HIV risk behavior (r= -.29, p=.00). When examining treatment engagement and specific HIV risk behavior (injection, non-injection, and sexual), analyses show that higher levels of treatment engagement is associated with lower injection (r=-.23, p=.00,) sex risk (r= -.35, p=.00) and non-injection risk behavior (r= -.23, p=.00).

When examining specific aspects of treatment engagement (treatment satisfaction, counseling rapport, and treatment participation) and HIV risk behavior (injection risk, non-injection risk, and sex risk), analyses show that counseling rapport, treatment participation, and treatment satisfaction are significantly associated with the different types of HIV risk behavior. Correlations coefficients for treatment satisfaction in relationship to HIV risk behavior (sex risk, non-injection risk, and injection risk) were -.18** and -.13+, and -.15*, respectively, indicating that increased levels of treatment satisfaction were associated with lower sex, non-injection, and injection risk behavior.

In addition, correlations coefficients for treatment participation and HIV risk behavior (sex, non-injection, and injection risk) were -.43**, -.31**, and -.29** respectively, indicating that higher levels of treatment participation were associated with lower sex, non-injection, and injection risk behavior. Correlation coefficients for counseling rapport and HIV risk behavior (sex, non-injection, and injection risk) were -.28**, -.15*, and -.15* respectively, indicating that higher levels of counseling rapport were associated with lower sex, non-injection, and injection risk behavior.

Thirdly, when examining HIV risk attitudes (ARRM Model) and HIV risk behavior, study findings reveal that certain ARRM constructs (perceived susceptibility, intended risk reduction, and peer norms) are significantly correlated to HIV risk behavior. Specifically, higher

levels of perceived susceptibility to HIV/AIDS were associated with higher HIV risk behavior (r=.26, p=.00). In addition, higher levels of intended risk reduction (r= -.31, p= .00) and peer norm attitudes(r=-.15, p=.04) were also associated with lower HIV behavior. All other ARRM constructs (fear, HIV knowledge, cues to action, perceived risk of infection, self-efficacy, and response efficacy) were not significantly correlated with HIV risk behavior.

When examining HIV risk attitudes (perceived susceptibility, intended risk reduction, and peer norms) in relationship to specific aspects of HIV risk behavior analyses show that perceived susceptibility was positively and significantly correlated with sex , non-injection, and injection risk behavior. Correlation coefficients were .19**, .24**, and .26** respectively, indicating that higher levels of perceived susceptibility were associated with higher sex, non-injection, and injection risk behavior. Additionally, intended risk reduction attitudes were negatively correlated with sex, non-injection, and injection risk behavior. Correlation coefficients for intended risk reduction were -.28**, -.22**, and -.28** respectively, indicating that higher levels of intended risk reduction attitudes were associated with lower sex, non-injection, and injection risk behavior. For peer norms the correlation coefficients were -.15* and -.13+, respectively, indicating that higher levels of peer norms were associated with lower non-injection and injection risk behavior.

Finally, the bivariate analyses revealed that there is a significant relationship between psychological dysfunction and treatment engagement. Specifically, higher levels of psychological dysfunction were associated with lower treatment engagement (r= -.34, p= .00). When examining psychological dysfunction and specific aspects of treatment engagement (treatment satisfaction, counseling rapport, and treatment participation) analyses show that psychological dysfunction was significantly correlated with treatment satisfaction, counseling

rapport, and treatment participation. Correlation coefficients were -.29**, -.30**, and -.29** respectively, indicating that higher levels of psychological dysfunction were associated with lower levels of treatment satisfaction, counseling rapport, and treatment participation.

Additionally, when examining specific aspects of psychological dysfunction (anxiety, hostility, and depression) and treatment engagement (treatment satisfaction, counseling rapport, and treatment participation), analyses show that there were significant relationships. Specifically, higher levels of depressive symptoms were significantly correlated with treatment satisfaction (r= -.22, p= .00), treatment participation (r= -.32, p= .00), and counseling rapport (r= -.24, p= .00). Higher levels of anxiety symptoms were also significantly correlated with treatment satisfaction (r= -.22, p= .00) and counseling rapport (r= -.17, p=.02). Lastly, higher levels of hostility symptoms were significantly correlated with treatment satisfaction (r= -.20, p= .00), treatment participation (r= -.23, p=.00), and counseling rapport (r= -.25, p=.00).

Table 3. Bivariate Correlation Matrix Among Study Variables

	Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1.	Gender	-																
2.	Age	.19**	-															
3.	Time in treatment	-.10	.40**	-														
4.	Race	-.17*	-.47**	-.12*	-													
5.	HIV risk behavior	.02	-.43**	-.25**	.06	-												
6.	Psychological Dys	.01	-.13+	-.10	.00	.24**	-											
7.	Treatment Eng.	-.00	.17*	.08	.05	-.33**	-.34**	-										
8.	HIV knowledge	-.14*	-.00	-.02	.03	.04	-.02	-.00	-									
9.	Informational Cues	-.02	.09	-.04	-.11	-.08	-.03	.16*	.01	-								
10.	Interpersonal Cues	.00	.32**	.07	-.29**	.02	.12	-.06	.15*	.22**	-							
11.	Perceived Susp.	.11	-.03	-.13+	-.09	.26**	.16*	-.10	.06	-.07	.15*	-						
12.	Perceived Risk	.12	-.02	.01	-.09	.10	.15*	-.07	.03	-.05	.08	.38**	-					
13.	Response Efficacy	-.07	-.14*	-.13+	.10	.12	-.07	.09	.13+	.03	-.07	.24**	-.03	-				
14.	Self-Efficacy	-.11	-.02	.06	.01	-.07	-.12+	.23**	.20**	.18*	-.00	-.15*	-.01	.36**	-			
15.	Intended Risk Red.	-.12+	.11	.13+	-.04	-.31**	-.20**	.31**	-.03	.25**	-.04	-.22**	-.09	.14+	.51**	-		
16.	Peer Norms	-.10	.15*	.13+	.07	-.15*	-.05	.24*	.09	.15*	-.02	-.23**	-.18**	.19**	.28**	.34**	-	
17.	Fear	-.17*	-.09	.05	.06	.11	-.02	.04	.21**	.08	-.04	-.01	-.15*	.15*	.21**	.19**	.14+	-

Note: Dichotomous variables were coded as follows: gender: 1 = female, 2 = male; race: 1 = African American, 2 = white

+p≤.10; *p≤.05; **p≤.01

Table 4. Bivariate Correlation Matrix Among Subscale Study Variables

	Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1.	Treatment Satisfaction	-														
2.	Counseling Rapport	.54**	-													
3.	Treatment Participation	.48**	.74**	-												
4.	Anxiety	-.22**	-.17*	-.10	-											
5.	Hostility	-.20**	-.25**	-.23*	.31**	-										
6.	Depression	-.22*	-.24**	-.32	.36**	.28**	-									
7.	Intended Risk Reduction	.23*	-.21**	.36**	-.01	-.22**	-.23**	-								
8.	Perceived Susceptibility	-.12*	-.05	-.09	.06	.16*	.15*	-.22**	-							
9.	Peer Norms	.11	.19**	.32**	.08	.13+	-.07	.34**	-.23**	-						
10.	Sexual Risk	-.18*	-.28**	-.43**	.09	.26**	.11	-.28**	.19**	-.10	-					
11.	Non-Injection Risk	-.13+	-.15*	-.31**	.10	.24**	.14+	-.22**	.24**	.15*	.59**	-				
12.	Injection Risk	-.15*	-.15*	.29*	.03	.22**	.12+	-.28**	.26**	.13+	.51**	.48**	-			
13.	HIV Risk Behavior	-.19**	-.25**	.43**	.10	.29**	.14*	-.31**	.26**	-.15*	.90**	.84**	.72**	-		
14.	Psychological Dysfunction	-.29**	-.30**	-.29**	.77**	.73**	.71**	-.20**	.16*	-.05	.21**	.21**	.16*	.24**	-	
15.	Treatment Engagement	.81**	-.89**	.86**	-.19**	-.27**	-.31**	.31**	.10	.24**	-.35**	-.23**	-.23**	-.33**	-.34**	-

Note: Due to the non-significant relationship of all other HIV risk attitudes (fear, HIV knowledge, cues to action, perceived risk of infection, self-efficacy, and response efficacy), to subscale study variables they were not added to this correlation matrix.

+p≤.10; *p≤.05; **p≤.01

5.3.2 Regression Analyses

First, regression analyses were used to assess what specific combination of independent variables, psychological dysfunction (anxiety, depression, and hostility) and treatment engagement (treatment satisfaction, counseling rapport, and treatment participation), best predicted level of HIV risk behavior (sex, non-injection, and injection risk). Secondly, regression analyses were utilized to assess whether or not, and to what extent, the independent variables of the ARRM predicted HIV risk behavior (sex, non-injection, and injection risk). Lastly, this method was also utilized to conduct path analyses to asses the potential mediating effects of treatment engagement and HIV risk reduction attitudes on the relationship between psychological dysfunction and HIV risk behavior.

The regression analyses utilized to answer the first and second multivariate research questions involved two steps. First, in order to control for the effects of demographic variables on HIV Risk behavior, four variables (age, gender, race, and length of time in treatment) were entered as a block in the regression model. Second, psychological dysfunction (anxiety, depression, and hostility), and treatment engagement (treatment satisfaction, counseling rapport, and treatment participation), were entered simultaneously into the regression equation. However, when entering constructs of the ARRM Model (second question) sequential multiple regression analyses were utilized to enter the variables according to the different stages of the model.

5.3.2.1 Prediction of HIV Risk Behavior

As shown in Table 5, the four demographic variables (control variables) explained 21% of the variance in HIV risk behavior, $F(4, 192) = 13.74$, $p = .000$. Age ($\beta = -.51$, $p = .00$) was a significant

predictor of HIV risk behavior, indicating that older methadone clients reported lower levels of HIV risk behavior. In addition, race (β= -.17, p=.02) was also a significant predictor of HIV risk behavior, indicating that white methadone clients reported lower levels of HIV risk behavior. At Step 2, psychological dysfunction and treatment engagement explained 27% of the variance in HIV risk behavior, F (6, 186) = 13.06, p= .000. Treatment engagement was a significant predictor of HIV risk behavior (β= -.22, p=. 00), indicating that those who reported higher levels of treatment engagement had lower levels of HIV risk behavior, net of the demographics variables. Unlike the findings from treatment engagement, psychological dysfunction did not significantly predict HIV risk behavior (β= .10).

Table 5. Multiple Regression Analyses for Predicting HIV Risk behavior

Model	Variables	B	β	R	Adj. R^2
1				.48	.21
	Age	-.99	-.51**		
	Gender	3.63	.08		
	Time in treatment	-.04	-.06		
	Race	-8.11	-.17*		
2				.54	.27
	Psychological Dysfunction	.11	.10		
	Treatment Engagement	-.23	-.22**		

Note: Dichotomous variables were coded as follows: gender: 1= female, 2= male;
Race: 1=African American, 2=white.
$^{+}p \leq .10$; $^{*}p \leq .05$; $^{**}p \leq .01$

5.3.3 Prediction of HIV Risk from Specific Psychological Problems and Treatment Engagement (Treatment Satisfaction, Counseling Rapport, and Treatment Part.)

As shown in Table 6, the four demographic explained 21% of the variance in HIV risk behavior, F (4, 188) =13.74, p=.000. Age (β= -.51, p=.00) was a significant predictor of HIV risk behavior, indicating that older methadone clients reported lower levels of HIV risk behavior. Race (β=.-17, p=.02) was also significant, indicating that white methadone clients reported lower levels of HIV risk behavior. At Step 2, specific aspects psychological dysfunction (anxiety, hostility, and depression) and treatment engagement (treatment satisfaction, counseling rapport, and treatment participation) explained 32% of the variance in HIV risk behavior, F (10, 182) = 10.10, p= .000. Hostility (β=. 18, p=. 01), and treatment participation (β= -.39, p=. 00), were significant predictors of HIV risk behavior. Specifically, hostility had a positive impact on HIV risk behavior, indicating that those who reported higher levels of hostility symptoms would be engaged in higher levels of HIV risk behavior. Treatment participation was also a significant predictor of HIV risk behavior, indicating that those who reported higher levels of treatment participation engaged in lower levels of HIV risk behavior. However, at this step race was no longer a significant predictor of HIV risk behavior.

Similarly, treatment satisfaction was not significantly related to HIV risk behavior after treatment satisfaction and treatment participation are controlled.

Table 6. Multiple Regression Analyses for Predicting HIV Risk behavior

Model	Variables	B	β	R	Adj. R^2
1				.48	.21
	Age	-.99	-.51**		
	Gender	3.63	.08		
	Time in treatment	-.04	-.06		
	Race	-8.11	-.17*		
2				.60	.32
	Anxiety	-.02	.01		
	Hostility	.43	.19*		
	Depression	-.06	-.02		
	Treatment Satisfaction	.03	.01		
	Counseling Rapport	.32	.12		
	Treatment Participation	-1.13	-.40**		

Note: Dichotomous variables were coded as follows: gender: 1= female, 2= male;
Race: 1=African American, 2=white.
$^{+}p \leq .10$; $^{*}p \leq .05$; $^{**}p \leq .01$

5.3.4 Predicting HIV risk behavior from ARRM Constructs

As shown in Table, 7, the four demographic variables explained 21% of the variance in HIV risk behavior, F (4, 183) =13.43, p=.00. Age (β=-.51, p=.00). Age was a significant predictor of HIV risk behavior, indicating that older methadone clients reported lower levels of HIV risk behavior. Race (β= -.17, p=.02) was also a significant predictor of HIV risk behavior. At step 2, HIV knowledge, perceived susceptibility, and perceived risk of infection explained 25% of the variance in HIV risk behavior, F (7, 180) =9.79, p=.00. Perceived susceptibility was a significant predictor of HIV risk behavior (β=.23, p=.00), indicating that those who reported higher levels of perceived susceptibility to HIV were more likely to be engaged in higher levels of HIV risk behavior. At step 3, Informational/Interpersonal cues, response efficacy, self-efficacy, intended risk reduction, peer norms and fear of HIV explained 30% of variance in HIV risk behavior, F

(14, 173) =6.78, p=.00. Interpersonal cues were a marginally significant predictor of HIV risk behavior (β=.12, p=.09), indicating that those who reported higher levels of interpersonal cues to action would engage in higher levels of HIV risk behavior.

Intended risk reduction attitudes also significantly predicted HIV risk behavior (β= -.28, p=.00), indicating that those who reported higher levels of intended risk reduction attitudes engaged in fewer HIV risk behaviors. Lastly, fear of HIV was a significant predictor of HIV risk behavior (β=.13, p=.05), indicating that those who reported higher levels of fear regarding HIV were those who engaged in higher levels of HIV risk behavior.

Table 7. Multiple Regression Analyses for Predicting HIV Risk behavior from ARRM

Model	Variables	B	β	R	Adj. R^2
1				.48	.21
	Age	-.99	-.51**		
	Gender	3.63	.08		
	Time in treatment	-.04	-.06		
	Race	-8.11	-.17*		
2				.53	.25
	HIV Knowledge	.46	.04		
	Perceived Susceptibility	3.85	.23**		
	Perceived Risk	-.42	-.03		
3				.60	.30
	Informational Cues	-.46	-.02		
	Interpersonal Cues	3.08	.12+		
	Response Efficacy	.35	.03		
	Self-Efficacy	.32	.04		
	Risk Reduction	-2.40	-.28**		
	Peer Norms	.32	.03		
	Fear	3.97	.13*		

Note: Dichotomous variables were coded as follows: gender: 1= female, 2= male;
Race: 1=African American, 2=white.
+p≤.10; *p≤.05; **p≤.01

5.3.5 Mediating Effects of Treatment Engagement on the relationship between Psychological Dysfunction and HIV Risk behavior

In order to examine the research question regarding the mediating effects of treatment engagement on psychological dysfunction and HIV risk behavior, I conducted path analyses using simultaneous regression model. Demographic variables, length of time in drug treatment, race, age, and gender were controlled for in the model test on the basis of their relationship with two or more central variables. For example, participants with higher scores on the HIV risk measure and who do not have severe psychological problems may have less time in treatment and therefore may not have experienced the benefits of being in drug treatment. In methadone maintenance treatment there is a minimum threshold of one year in order to detect favorable outcomes (NIH, 1999). Research suggests that if clients are in treatment for more than a year they are more likely to have outcomes that are more favorable on drug use and criminality measures (Simpson & Brown, 1997). Two of the subscales of the HIV risk measure exclusively examine drug use (injection and non-injection drug use). The relationship of higher scores on the HIV risk measure may be explained by the fact that the participants are early in the treatment or recovery process and may still be using or relapsing therefore exhibiting more risk behavior. Following Baron and Kenny (1986), I used a three-step regression procedure.

In the first step, HIV risk behavior was entered as the dependent variable and psychological dysfunction along with the control variables were entered as independent variables. In the second step, treatment engagement was entered as the dependent variable and psychological dysfunction and the control variables were entered as independent variables. In the last step, HIV risk behavior was entered as the dependent variable and psychological

dysfunction, treatment engagement, and the control variables were entered as independent variables.

The results of the mediated regression are shown in Table 8. Coefficients for each of the regressions are reported. The results indicate that psychological dysfunction is negatively related to treatment engagement ($\beta = -.31$, $p < .01$), which, in turn, is related to higher levels of HIV risk behavior ($\beta = -.22$, $p < .01$). Mediation is established, indicating that the effect of psychological dysfunction on HIV risk behavior is mediated through treatment engagement. The Sobel Test indicated a significant indirect effect, ($p = .008$). Figure 2 shows the path analyses of the mediating role of drug treatment engagement in relationship to psychological dysfunction and drug treatment engagement.

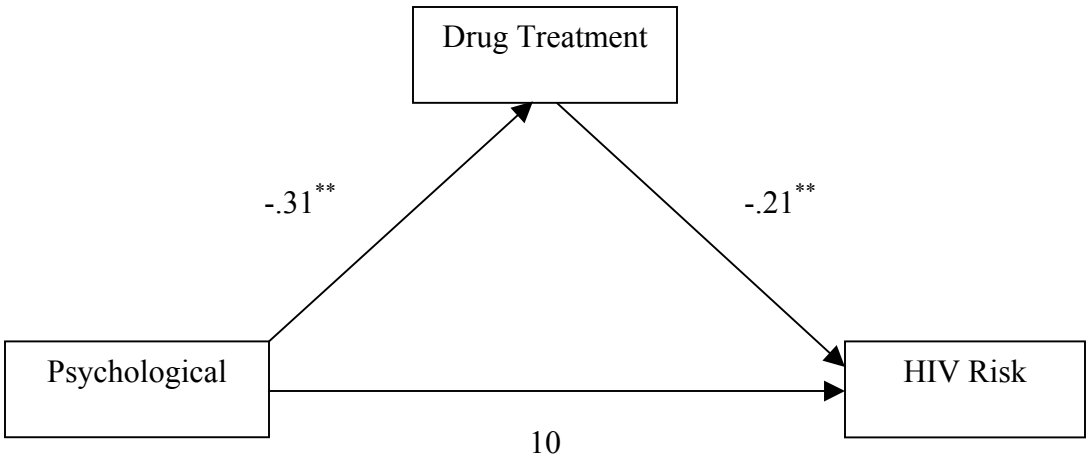

Figure 2. Results of the Path Analysis

Figure 2 shows path analysis showing mediating role of drug treatment engagement in relation to the psychological dysfunction and HIV risk behavior. Although the control variable was entered in path analysis, it is not shown in Figure 2 to enhance clarity.

Table 8 Multiple Regression Testing the Mediating Effects of Treatment Engagement in the Relationship between Psychological Dysfunction and HIV Risk Behavior

Regressing HIV on Demographic Variables and Psychological Dysfunction					
Step1	Variables	B	β	R	Adj. R^2
1				.48	.21
	Age	- .99	.51**		
	Race	-8.01	-.17*		
	Gender	3.63	.08		
	Time in treatment	-.04	-.06		
2				.51	.24
	Psychological Dysfunction	.19	.17**		
Regressing Treatment Engagement on Demographics & Psychological Dysfunction					
Step 2	Variables	B	β	R	Adj. R^2
1				.21	.03
	Age	.46	.25**		
	Race	6.67	.15+		
	Gender	-.95	-.02		
	Time in treatment	-.01	-.02		
2				.37	.12
	Psychological Dysfunction	- .32	-.31**		
Regressing HIV Risk on Demographics, Psychological Dysfunction, & Treatment Engage					
Step3	Variables	B	β	R	Adj. R^2
1				.48	.21
	Age	-.82	-.42**		
	Race	-8.11	-.17*		
	Gender	3.64	.08		
	Time in treatment	-.04	-.06		
2				.54	.27
	Psychological Dysfunction	.11	.10		
	Treatment Engagement	-.23	-.22**		

Note: Dichotomous variables were coded as follows: gender: 1= female, 2= male;
Race: 1=African American, 2=white.
+p≤.10; *p≤.05; **p≤.01

5.3.6 Mediating Effects of Risk Reduction Attitudes on the relationship between Psychological Dysfunction and HIV Risk behavior

In examining the last research question of this study, psychological dysfunction was not found to be a significant predictor of HIV risk behavior after controlling for the selected demographic variables. Similarly, psychological dysfunction did not significantly predict risk reduction attitudes after controlling for the demographic variables (Table 9). Two of the necessary conditions for mediation are that the independent variable must be associated with the mediator variable and the associated the dependent variable. Since neither condition was met, it is safe to assume that risk reduction attitudes do not mediate the relationship between psychological dysfunction and HIV risk behavior.

Table 9 Multiple Regression Testing the Mediating Effects of Risk Reduction Attitudes in the Relationship between Psychological Dysfunction and HIV Risk Behavior

Regressing HIV Risk on Demographic Variables & Psychological Dysfunction					
Step1	Variables	B	β	R	Adj. R²
1				.48	.21
	Age	- .99	.51**		
	Race	-8.01	-.17*		
	Gender	3.63	.08		
	Time in treatment	-.04	-.06		
2				.51	.24
Psychological Dysfunction		-.19	.17*		
Regressing Risk Reduction Attitudes on Demographics & Psychological Dysfunction					
Step 2	Variables	B	β	R	Adj. R²
1				.18	.01
	Age	- .02	.11		
	Race	- .04	-.01		
	Gender	-.72	-.13		
	Time in treatment	.00	.05		
2				.25	.04
	Psychological Dysfunction	-.02	-.17		
Regressing HIV Risk on Demographics, Psychological Dysfunction, & Risk Red. Attitudes					
Step3	Variables	B	β	R	Adj. R²
1				.51	.24
	Age	- .95	-.48**		
	Race	- 7.58	-.16*		
	Gender	3.51	.07		
	Time in treatment	-.04	-.05		
2				.55	.28
	Psychological Dysfunction	.14	.13*		
	Risk Reduction Attitudes	-1.95	-.23**		

Note: Dichotomous variables were coded as follows: gender: 1= female, 2= male;
Race: 1=African American, 2=white.
$^{+}p \leq .10$; $^{*}p \leq .05$; $^{**}p \leq .01$

6.0 DISCUSSION

The main purpose of this study was to investigate the influence of psychological dysfunction and treatment engagement on HIV risk behavior among methadone maintained clients. The study also examined the mediating role of treatment engagement and HIV risk reduction attitudes on HIV risk behavior.

This chapter discusses the main findings of the study. It is divided into the following sections; summary and interpretation of main findings; strengths and limitations of the study; and implications for the social work and public health.

6.1 SUMMARY OF MAIN FINDINGS

This study's findings shed light on the factors that impact HIV risk behavior among methadone maintained clients. The analyses revealed similarities and differences with the existing literature. Since many of the scales used in this study derived from the national Drug Abuse Treatment and Assessment Resources Study (DATAR), I will compare my findings to their 2001 results, as well as to other pertinent studies.

The current study found that about 60% of the participants had experienced moderate to high levels of psychological dysfunction. When examining specific aspects of psychological

dysfunction, 76.5% experienced moderate to high depressive symptoms, 53.5% experienced moderate to high hostility symptoms, and 73% experienced moderate to high anxiety symptoms.

Compared to means for depression, anxiety, and hostility from DATAR (2001), respondents in the study experienced higher levels of anxiety (31.3 vs. 28.4) symptoms but roughly comparable levels of hostility (24.4 vs. 23.4) and depressive (25.7 vs. 25.5) symptoms.

When the results are compared to DATAR findings for the percent of clients reporting problems with psycho-social functioning during treatment this sample reported significantly higher rates of problems. Specifically, participants scoring higher than 30 on any of the psychological dysfunction measures are considered to have problems associated to the specific disorder. This study's results revealed that this sample reported 25%, 42.5%, and 53% respectively for problems associated with hostility, depression, and anxiety. However, results from the DATAR reveal that clients nationally have fewer problems with percentages at 21%, 26%, and 38% respectively for hostility, depression, and anxiety. These findings are particularly high for the study's respondents and may suggest the need for interventions that address psychological problems among clients enrolled in methadone drug treatment (Simpson, 2001).

The current study found that participants were less engaged in their treatment process. When compared to national data from DATAR, the percentage of the sample scoring high on treatment engagement scales were significantly lower. Specifically, scores over 40 are considered to be high (Simpson, 2001). Finding from this study indicate that only 23%, 30%, and 31% respectively reported high treatment satisfaction, counseling rapport, and treatment participation. However, the national sample reported 34%, 50%, and 53% respectively on high treatment satisfaction, counseling rapport, and treatment participation. When comparing this study's mean scores on the treatment engagement scales the scores are quite comparable to

national data. Specifically, for treatment satisfaction (36.0 vs. 37.8) scores were slightly lower but indicating that participants were satisfied with treatment. Scores on treatment participation (37.7 vs. 40.6) and counseling rapport (36.6 vs. 39.6) were also slightly lower but still indicating that the sample had moderate participation in treatment and moderate rates of counseling rapport (Simpson, 2001).

The current study found psychological dysfunction to be moderately and significantly correlated to treatment engagement (treatment satisfaction, counseling rapport, and treatment participation), indicating that those who reported high levels of psychological dysfunction also reported low levels of treatment engagement.

This finding is mixed when compared with other studies that assessed psychological problems and treatment engagement. Specifically, Joe, Brown and Simpson (1995), found that clients with higher levels of psychological problems were more likely than those with fewer psychological problems to participate in drug treatment (attend recommended counseling session per month) and were more likely to discuss psychological issues in their counseling sessions. However, other research suggests that clients with increased rates of psychological problems perform worst during treatment (Woody et al., 1997). In addition, the complexity and severity of psychological problems are said to hinder efforts to reduce drug use and impact the participation in drug treatment (Simpson, 2001).

The prevalence of injection drug use was moderately high among participants in this study. Injection drug use accounts for one-third of all new diagnosed HIV persons. Almost half (45.5%) of the participants reported injection drug use during the 3 months prior to the study. The rates of injection drug use among this sample are consistent with earlier reports of injection

drug use in methadone maintenance clients (Camacho et al., 1996; Bux et al., 1995; Ball et al., 1988).

Of those that injected, 19% injected more than 10 times and 26.5% injected between 6-10 times during the past 3 months. Nineteen percent of the sample reported that they shared needles and of those that shared needles, 16% reported sharing with 1 or more persons. Other studies have reported sample sharing at rates of 6% - 47.5 % (Camacho et al., 1996; Bux et al., 1995; Darke, et al., 1990; Donoghoe et al., 1989). When comparing this study's needle sharing rates with another Pennsylvania study utilizing methadone clients, this sample shared needles at a much higher rate (19% vs. 6%). Finally, given that needle sharing is taking place among injection drug users, cleaning practices are of grave importance, with evidence existing from this study that cleaning practice are far from adequate. Thus, while 40% of the sample claimed that they always cleaned their needles before re-using, only 23.6% used bleach every time.

In addition to injection drug use, the prevalence of non-injection drug use was also extremely high. Almost the entire sample (97%) reported that they smoked, snorted, sniffed, or took orally some kind of drug. The drugs most commonly used drugs were: alcohol (54%), prescription medications (50%) (i.e., Xanax, Klonopin, and Valium), marijuana (45%), heroin (44%), and crack cocaine (43%). Almost half the sample reported being drunk one or more times during the three months prior to the study. When compared to the other study in Pennsylvania utilizing the methadone this sample reported more drug use (Bux et al., 1995). Specifically, this sample used more alcohol (54% vs. 47%), prescription medications (50% vs. 26%), heroin (44% vs. 40%), and crack cocaine (43% vs. 32%).

This study's bivariate correlation findings indicated that high levels of non-injection drug use are associated with high levels of psychological dysfunction. Additionally, findings revealed

that increased levels of non-injection drug use are also associated with low levels of treatment engagement. These findings are congruent with the existing literature (Camacho et al., 1996; Joe et al, 1995; Simpson et al. 1993).

Of the entire sample, 78% of the participants had engaged in sex in the previous 3 months. Overall, 22.5% of the participants had more than one sex partner in the previous 3 months. Thirty percent of the subjects had engaged in prostitution during this period. These findings are somewhat different than the other PA study. Specifically, this sample engaged in higher rates of sex (78% vs.67%), prostitution (30% vs. 3%), and had greater rates of having sex with more than one sex partner (22.5% vs. 6%) (Bux et al., 1995).

Almost half (45%) of the participants who had a regular partner had not used condoms with their partner during the study period. Only 27% had always used a condom with their regular partner. Nearly half (49%) of the participants had engaged in sex with a casual partner. Of these participants, 27.5% never used a condom, with 41.8% always having used a condom. Of all of the participants who had engaged in prostitution only one-third (31.7%) reported using condoms all of the time. This rate is significantly higher than other studies assessing HIV risk behavior (Camacho et al., 1996; Bux et al., 1995). A sizeable portion of participants had engaged in oral sex (69.5%) and anal sex (18.5%) in the 3 months preceding the study. Ten percent (N=20) of the respondents reported that they had tested positive for HIV.

This study's bivariate correlation findings indicated that high levels of sexual risk behavior are associated with high levels of psychological dysfunction. Additionally, findings reveal that increased levels of sexual risk behavior are also associated with low levels of treatment engagement. These findings are congruent with the existing literature (Latkin et al., 2004; Camacho et al., 1996; Joe et al., 1991; Simpson et al., 1993).

6.1.1 Assessing the Study's Main Research Questions

In this study, I explored several research questions; however, for my discussion I will focus my assessment around my three main questions. The first main research question examined various psychological, ARRM, and treatment engagement variables in the terms of their impact on HIV risk behavior. The second main question examined the mediating effect of treatment engagement on HIV risk behavior. The third main question examined the mediating effect of risk reduction attitudes on HIV risk behavior. There were two versions of the independent variables used in theses analyses: an overall version of psychological dysfunction and treatment engagement and the subscale version of each of these versions.

With respect to the first research question, assessing overall psychological dysfunction and treatment engagement on HIV risk behavior; only treatment engagement was a significant predictor of HIV risk behavior net of demographics and control variables. This finding suggests that high levels of treatment engagement predict lower levels of HIV risk behavior.

When assessing the specific subscales of psychological dysfunction (hostility, anxiety, and depression) and treatment engagement (treatment satisfaction, counseling rapport, and treatment participation) on HIV risk behavior, two (hostility and treatment participation) out of the six variables were significant predictors of HIV risk behavior. Specifically, hostility (β= .19, p= $\leq$.05) was a significant predictor of HIV risk behavior, indicating that increased levels of hostility symptoms predict high levels of HIV risk behavior. In addition, treatment participation (β= .-.40, p= $\leq$.01) was a significant predictor of HIV risk behavior, indicating that increased levels of treatment participation predicts low levels of HIV risk behavior. The reasons that the other variables did not predict HIV risk behavior significantly, may be attributed to the fact that the variables are highly correlated with a number of other variables in the regression model.

The second research question assessed the impact of the ARRM variables on predicting HIV risk behavior. Four (perceived susceptibility, interpersonal cues, risk reduction, and fear) out of 10 ARRM variables significantly predicted HIV risk behavior. Findings suggest that those who reported higher levels of perceived susceptibility fear, and interpersonal cues also reported higher levels of HIV risk behavior. In addition, higher levels of intended risk reduction attitudes also predicted lower levels of HIV risk behaviors. These variables explained 28% of the total variance in HIV risk behavior.

Lastly, this study attempted to assess whether or not drug treatment engagement and risk reduction attitudes mediated the relationship between psychological dysfunction and HIV risk behavior. Results indicated that the effect of psychological dysfunction on HIV risk is mediated through treatment engagement but risk reduction attitudes did not mediate the relationship between psychological dysfunction and HIV risk behavior. These findings extend the current literature in that previous studies do not assess the impact of mediators on the relationship between psychological dysfunction and HIV risk behavior.

6.2 STRENGTHS AND LIMITATIONS OF THE STUDY

The present study attempted to address several important limitations and gaps in the literature on the relationship between psychological dysfunction and HIV risk behavior. These gaps and limitations focus on measurement, mediators, and research design. The specific limitations that the study sought to address include the following: First, previous research examining the role of psychological dysfunction, treatment engagement, and ARRM variables on HIV risk behaviors have used various types of HIV risk behavior measures (Robinson & Evans, 1999; Samuel et al.,

1993; Simpson, Knight, & Ray, 1993). Most studies address only a single aspect of HIV risk behavior such as sexual behavior or injection drug use. Additionally, many studies only utilize a single measure of occurrence of unprotected sex/or number of sex partners or a single occurrence of injection drug use/ or number of times sharing needles. This study focused on a more comprehensive model of HIV risk behavior, which is indicative of substance abusing populations (sexual behaviors, non-injection drug use/alcohol use, and injection drug use).

Second, this study utilized a composite index that combined unprotected sexual risk with the number of sex partners, injection frequency with sharing needles, and non-injection drug use such as smoking crack/snorting cocaine or using prescription drugs such as benzodiazepines or oxycodone. Utilizing this type of measure increased the likelihood that the instrument was more sensitive in detecting the association between psychological dysfunction and a composite measure of HIV risk behavior rather than a single measure of an occurring risk behavior.

Third, this study had a relatively strong design in respect to the temporal relationship between the measures, which perhaps aided in the strength of the statistical associations. The psychological dysfunction, drug treatment engagement, and the HIV risk behavior measures assessed affect and behavior in the past 3 month. Prior studies have assessed affect in past week and behavior in past month, which may have diminished the strength of association in past studies.

Despite its strengths, this study has several limitations that should be discussed. The first two limitations relate to the use of self-reporting of highly sensitive information. First, the reliance on self-report measures of all central study variables are a cause for concern in regard to the internal validity of the relationships due to response distortions (over or under reporting, recall error, and social desirability). For example, participants may have had problems disclosing

sensitive information. Many participants may have not wanted to give an honest account of their sexual behavior such as having anal sex or trading sex for drugs or money, which is common among this population. A second limitation of the study is that it was conducted on site at a methadone treatment facility. Some participants may have felt that they could not be completely honest in reporting their drug use due to the fear (e.g. possible punitive sanctions for continued drug use) or that their confidentiality would not be protected. To address this problem I made every attempt to ensure participants that their confidentiality and anonymity would be protected (no identifying information was put on the survey and the study was conducted in a private location within the treatment facility). Despite these concerns, relatively large proportions of the sample did admit to these behaviors. These high proportions suggest that participants felt at least somewhat comfortable sharing this sensitive information.

A third limitation of the study is the cross-sectional research design. Because the study is cross-sectional, the results cannot definitively establish causality. It is important to note that, although the theoretical context introduced earlier suggests that psychological dysfunction may promote HIV risk behavior and that my data are consistent with the proposed model, there is a possibility that the casual direction may also run in the opposite direction. That is HIV risk behavior may cause increased levels of psychological dysfunction. Data collected over time (longitudinally) from the same respondents would provide an empirically stronger test of the model. An additional potential limitation of the study is that it makes an assumption regarding the external impact of the services being offered at the treatment facility. It is not certain that services offered at the treatment facility were evenly distributed among clients participating in the study and it's impossible to know whether or not clients received the same quality and level of counseling services. Research suggests that the therapist/counselor is a significant factor in

determining treatment outcomes. Therapists who have strong interpersonal skills such as empathy and have the ability to forge therapeutic alliances/counseling rapport are reported to have better treatment outcomes (Najavitis & Weiss, 1994). Furthermore, there were contextual differences (i.e., community differences-high crime rates, community violence, high-rates of drug abuse, and drug availability) among the clients participating in this study that could have had an impact on the outcome of the study's results.

Finally, there is at the least one unaddressed threat to the external validity of this study. The sample utilized for this study is a purposive sample and is limited to participants of one methadone treatment facility. This sampling strategy limits the sample to individuals who are only enrolled in methadone treatment. Thus, the findings might not be generalizeable to others enrolled in other types of drug treatment modalities (out-patient (drug-free), residential, partial hospitalization) or to methadone clients in other locations.

6.3 IMPLICATIONS FOR SOCIAL WORK POLICY, PRACTICE, AND DELIVERY

Despite the limitations of this study, the current study makes a significant contribution to the existing literature. There is scant research on the HIV risk taking behavior of individuals who are addicted to opiates and have psychological problems. While there have been several studies on individuals addicted to opiates and the problems that they face, there has been little research that examines the predictors of HIV risk behavior among this population. Most studies do not assess HIV risk in a holistic manner (i.e., injection drug use, non-injection, and sexual risk behavior); however, this study has built upon the existing gaps and has found that there is a significant

relationship between psychological dysfunction, drug treatment engagement, and HIV risk behavior.

A continued detailed research on this population could provide public health officials, drug treatment professionals, and social workers with the opportunity to identify and modify the predictors of HIV risk behavior, which can help prevent or reduce the transmission of blood born viruses and ultimately save lives. Given the importance of injection drug use, non-injection drug use (e.g., crack pipes), and sexual behavior as routes of HIV transmission, there is an irrefutable need for risk reduction research and interventions to prevent and reduce the spread of blood born viruses among this population.

The results of this study suggest that there is also a need to screen and treat clients for psychological problems. Specifically, MMT programs should develop an effective early screening, assessment, referral, and psychiatric treatment system for clients enrolled in their treatment programs. Additionally, data suggest that psychological problems decrease methadone clients' drug treatment engagement (therapeutic relationship with counselor) and in turn, increase their HIV risk behavior. Therefore, counselors at methadone clinics must develop successful therapeutic relationships with all clients, but more specifically with clients who have psychological problems. According to the Center for Substance Abuse Treatment (CSAT), there is an association between the strength of the therapeutic alliance and counseling effectiveness. Research suggests therapeutic alliances are strong predictors of treatment participation, drinking behavior during treatment, and drinking behavior 12 months after treatment among outpatient alcoholic clients (Conners et al., 1997). Additionally, another study among opiate dependent clients with moderate to severe psychological problems, found that fewer than 25 percent of those with weak therapeutic alliances completed treatment, while more than 75 percent of those

with strong therapeutic alliances completed treatment (Petry and Bickel 1999). Methadone treatment counselors should follow the recommended guidelines developed by CSAT for regarding successful therapeutic techniques when working with clients with psychological problems. The guidelines are as follows: (1) develop and use a therapeutic alliance to engage clients in treatment, (2) maintain a recovery perspective, (3) manage countertransference, (4) monitor psychiatric symptoms, (5) use supportive and empathic counseling, (6) employ culturally appropriate counseling methods, and (7) increase structure and support for clients with psychological problems.

In addition these data suggest that in the midst of the HIV/AIDS epidemic, it is not sufficient for methadone programs and social workers to focus on whether or not the client has relapsed (drug use). In line with Metzger et al. (1991), counseling that includes discussion on overall high-risk behaviors is warranted. MMT counseling should incorporate HIV risk reduction plans that thoroughly examine not only injection drug risk behaviors but also those that examine sexual and non-injection drug risk behaviors. Methadone treatment providers (social workers and public health workers) must be trained in HIV risk reduction counseling and effective counseling methods for treatment of clients with psychological problems; even if many may feel that acknowledging such risky behaviors implies that the agency is accepting of drug use. These discussions are a crucial part of counseling and may provide opportunities for methadone clients to engage with the counselors on a deeper level and evaluate their risky behavior on a continuous basis. This continuous evaluation may provide opportunities for clients to modify their risky behavior.

The association between psychological dysfunction and drug treatment engagement, and the potential for these to be associated with increased rates of HIV risk behavior, has implication

for both drug treatment and HIV prevention efforts. As stated earlier, the data suggest the importance of early screening and treatment of psychological problems. Modifying psychological problems has the potential to impact the therapeutic relationship in a positive direction and potentially impact methadone clients overall HIV risk behavior. Concerning HIV prevention counseling, the data also suggest the need to assess clients for psychological problems because many clients engage in risky behaviors to alleviate the symptoms related to psychological problems (Morris & Reilly, 198; McKirnan et al., 1996).

Furthermore, policy makers need to provide additional resources to drug treatment and prevention programs so that they can provide comprehensive treatment services for clients with psychological problems (i.e., screening and assessment, mental and physical health consultations, on-site prescribing psychiatrist, medication monitoring, psycho-educational classes, and onsite dual recovery groups and self-help meetings). Social workers and public health officials should advocate for comprehensive services on the behalf of drug treatment clients. If resources were not available to provide comprehensive treatment services for clients, it would be imperative that counselors provide referrals to mental health care and other needed services. Research suggests that when clients have unmet psychiatric and other needs their ability to focus on their recovery can be compromised. However, when programs match the individual treatment needs of clients to treatment services that address those needs, outcomes are improved (Hser et al., 1999; McLellan, 1998, 1999). Thus, by providing comprehensive services, treatment agencies have the capacity to improve outcomes and reduce the ills associated with drug usage. Research suggests that for every $1 spent on addiction treatment more than $7 in future costs are saved. When addiction is left untreated (with its links to mental health, illness, and crime) it cost

individuals, families, and society an estimated $20 billion each year (National Institutes of Health, 1997).

Lastly, interventions that address HIV risk behavior among methadone client with psychological problems should assess and attempt to reduce psychological problems among its participants. By doing so, the intervention may be more efficacious in reducing risk behavior and hence HIV transmission. NIDA's Principles of Drug Addiction Treatment notes that "matching treatment settings, interventions, and services to each individual's particular problems and needs is critical to his or her ultimate success in returning to productive functioning in the family, workplace, and society" (NIDA, 1999, p.3). Given that this study found that methadone clients were experiencing significant problems as it relates mental health, HIV risk, and treatment engagement it is imperative that drug treatment programs consider the implications of such problems. Implementing such strategies suggested by NIDA and CSAT may improve treatment outcomes among methadone maintained clients and may garner increase support from opponents that dismiss methadone maintenance treatment as a useless, addictive narcotic substitution therapy.

APPENDIX A

IRB APPROVAL MEMORANDA PARAGRAPH.

University of Pittsburgh
Institutional Review Board

Exempt and Expedited Reviews

University of Pittsburgh FWA: 00006790
University of Pittsburgh Medical Center: FWA 00006735
Children's Hospital of Pittsburgh: FWA 00000600

3500 Fifth Avenue
Suite 100
Pittsburgh, PA 15213
Phone: 412.383.1480
Fax: 412.383.1508

TO: Latika Davis-Jones

FROM: Christopher M. Ryan, PhD, Vice Chair

DATE: February 13, 2007

PROTOCOL: Psychological Dysfunction, Drug Treatment Engagement and HIV Risk Behavior among Methadone Maintained Clients

IRB Number: 0701082

The above-referenced protocol has been reviewed by the University of Pittsburgh Institutional Review Board. Based on the information provided in the IRB protocol, this project meets all the necessary criteria for an exemption, and is hereby designated as "exempt" under section 45 CFR 46.101(b)(2).

Please note that the advertisement that was submitted for review has been approved as written.

- If any modifications are made to this project, please submit an 'exempt modification' form to the IRB.
- Please advise the **IRB** when your project has been completed so that it may be officially terminated in the IRB database.
- This research study may be audited by the University of Pittsburgh Research Conduct and Compliance Office.

Approval Date: February 13, 2007

CR:dj

APPENDIX B

TADISO, INC. PERMISSION LETTER FIRST PARAGRAPH.

January 5, 2007

Institutional Review Board (University of Pittsburgh):

We, Tadiso, Inc., authorize Latika Davis-Jones the right to conduct research at our main facility located at 1425 Beaver Avenue Pittsburgh, PA. We are in total support of Latika's efforts and welcome the opportunity to learn more about the population that we serve.

Thank you,

Taru J. Cook, MA, CAC
Chief Operating Officer
Tadiso, Inc.

APPENDIX C

RECRUITMENT LETTER/SURVEY INSTRUMENT

Winter/Spring 2007

Dear Tadiso Client:

Drug and alcohol problems affect many people each year. I am interested in learning about you and your drug treatment process and will be conducting a survey at your treatment facility for this purpose. I will need to collect information about your drug treatment experiences, drug use, and sexual behavior. A few questions are highly personal; however all information will be kept confidential.

I anticipate that this study will be helpful to drug & alcohol treatment providers in developing treatment strategies and prevention/intervention strategies for individuals like you.

This survey will take about 20 minutes to complete. This research is totally **voluntary and anonymous.** Your responses will be **kept in strict confidence.** For your protection all information will be stored in a secure database and your information will be kept in a locked file. I am asking that you **do not put your name or client ID number** on any of the pages of the survey in order to keep your identity completely **anonymous.** Participation in the study is voluntary and no way tied to your ability to receive services/methadone at Tadiso, Inc. If at anytime throughout the study you begin to feel uncomfortable you have the right to decide not to participate.

Upon completion participants will be compensated $5 dollars for their time. If you have any additional question, please call Latika Davis-Jones, MSW at 412-362-8510 Ext. 10.
I look forward to working with you and thank you in advance for your assistance.

Sincerely,
Latika Davis-Jones, MSW, Ph.D Student

A. TREATMENT EXPERIENCE

Please respond to each of the statements below by filling in the circle to indicate how much you agree or disagree with each one. Over the **past 3 months**, how much you agree or disagree with the following statement? Mark only one answer. **Please do not put your name or client ID number on this survey!**

	Strongly Disagree	Disagree	Uncertain	Agree	Strongly Agree
1. Time schedules for counseling sessions at this program are convenient for me.	①	②	③	④	⑤
2. This program expects me to learn responsibility and self-discipline.	①	②	③	④	⑤
3. This program is organized and run well	①	②	③	④	⑤
4. I am satisfied with this program	①	②	③	④	⑤
5. The staff here is efficient at doing its job	①	②	③	④	⑤
6. I can get plenty of personal counseling at this program.	①	②	③	④	⑤
7. This program location is convenient for me	①	②	③	④	⑤
8. I trust my counselor	①	②	③	④	⑤
9. It's always easy to follow or understand what my counselor is trying to tell me.	①	②	③	④	⑤
10. My counselor is easy to talk to	①	②	③	④	⑤
11. I am motivated and encouraged by my counselor.	①	②	③	④	⑤
12. My counselor recognizes the progress I make in treatment.	①	②	③	④	⑤
13. My counselor is well organized and prepared for each counseling session.	①	②	③	④	⑤
14. My counselor is sensitive to my situation and problems	①	②	③	④	⑤
15. My counselor makes me feel foolish or ashamed	①	②	③	④	⑤
16. My counselor views my problems and situations realistically.	①	②	③	④	⑤

Please do not put your name or client ID number on this survey!

	Strongly Disagree	Disagree	Uncertain	Agree	Strongly Agree
17. My counselor helps me develop confidence in myself.	①	②	③	④	⑤
18. My counselor respects me and my opinions.	①	②	③	④	⑤
19. I can depend on my counselor's understanding.	①	②	③	④	⑤
20. My treatment plan has reasonable objectives.	①	②	③	④	⑤
21. My counselor allows me to give feedback in my treatment plan	①	②	③	④	⑤
22. I am willing to talk about my feeling during counseling.	①	②	③	④	⑤
23. I have made progress with my drug/alcohol problems.	①	②	③	④	⑤
24. I have learned to analyze and plan ways to solve my problems.	①	②	③	④	⑤
25. I have made progress toward my treatment program goals.	①	②	③	④	⑤
26. I always attend the counseling sessions scheduled for me.	①	②	③	④	⑤
27. I have stopped or greatly reduced my drug use while in this program.	①	②	③	④	⑤
28. I always participate actively in my counseling sessions.	①	②	③	④	⑤
29. I have made progress in understanding my feelings and behavior.	①	②	③	④	⑤
30. I have improved my relations with other people because of this treatment.	①	②	③	④	⑤
31. I have made progress with my emotional or psychological issues.	①	②	③	④	⑤
32. I feel comfortable giving negative feedback during counseling.	①	②	③	④	⑤
33. I am following my counselor's guidance.	①	②	③	④	⑤

Please do not put your name or client ID number on this survey

Program Attendance

In the **past 3 months**, how many counseling/medication sessions did you attend at this treatment program?

1. Individual counseling sessions. _____ # of sessions

2. Group counseling sessions. _____ # of sessions

3. Family or other counseling sessions. _____# of sessions

4. Medicated with methadone _____# of days

B. RATING OF SELF

Over the **past 3 months**, how much you agree or disagree with the following statements? Please respond to each of the statements below by filling in the circle to indicate how much you agree or disagree.

	Strongly Disagree	Disagree	Uncertain	Agree	Strongly Agree
1. I feel interested in life.	①	②	③	④	⑤
2. I feel sad or depressed.	①	②	③	④	⑤
3. I feel extra tired or run down.	①	②	③	④	⑤
4. I worry or brood a lot.	①	②	③	④	⑤
5. I feel hopeless about the future.	①	②	③	④	⑤
6. I feel lonely.	①	②	③	④	⑤
7. I have trouble sleeping.	①	②	③	④	⑤
8. I have trouble concentrating or remembering things	①	②	③	④	⑤
9. I feel afraid of certain things like elevators, crowds, or going out alone.	①	②	③	④	⑤
10. I feel anxious or nervous.	①	②	③	④	⑤
11. I have trouble sitting still for long time.	①	②	③	④	⑤
12. I feel tense or keyed-up.	①	②	③	④	⑤
13. I feel tightness or tension in my muscles.	①	②	③	④	⑤
14. I have carried weapons, like knives or guns.	①	②	③	④	⑤
15. I feel a lot of anger inside me.	①	②	③	④	⑤
16. I have a hot temper.	①	②	③	④	⑤

Please do not put your name or client ID number on this survey!

	Strongly Disagree	Disagree	Uncertain	Agree	Strongly Agree
17. I like others to feel afraid of me.	①	②	③	④	⑤
18. I feel mistreated by other people.	①	②	③	④	⑤
19. I get mad at other people easily.	①	②	③	④	⑤
20. I have urges to fight or hurt others.	①	②	③	④	⑤
21. My temper gets me into fights or other trouble.	①	②	③	④	⑤

C. HEALTH BEHAVIOR

The next set of questions asks about your drug use and sexual activities. Although some of the questions are highly personal, please be completely **honest** in your answers. Remember that this **survey is completely anonymous and confidential!** Circle the best response for each question.

A. Drug Use

1. How many times have you injected any drugs in the **past 3 months**?

   0. I have not injected drugs in the past 3 months
   1. Once a week or less
   2. More than once a week (but less than once a day)
   3. Once a day
   4. 2-3 times a day
   5. More than 3 times a day

2. How many times in the **past 3 months** have you shared works (needle, cooker, cotton, water, other drug equipment)) after someone else had already used them?

   0. No times
   1. One time
   2. Two times
   3. 3-5 times
   4. 6-10 times
   5. More than 10 times

3. How many people have used the same works before you in the **past 3 months**?

   0. None
   1. One person
   2. Two people
   3. 3-5 people
   4. 6-10 people
   5. More than 10 people

Please do not put your name or client ID number on this survey!

4. How many times in the **past 3 months** has someone shared works after you had used them?

0. No times
1. One time
2. Two times
3. 3-5 times
4. 6-10 times
5. More than 10 times

5. How often, in the **past 3 months**, have you cleaned needles before re-using them?

0. I do not re-use
1. Every time
2. Often
3. Sometimes
4. Rarely
5. Never

6. Before using needles again, how often in the **past 3 months** did you use bleach to clean them?

0. I do not re-use
1. Every time
2. Often
3. Sometimes
4. Rarely
5. Never

7. The last time you used a needle to inject a drug, where did you get the needle?

0. Pharmacy/Needle Exchange/Hospital
1. Family Member/Friend (has access to sterile needles)
2. Off the street (someone sold you a needle)
3. Drug-using friend
4. Shooting Gallery
5. Friend/Partner that is known to be HIV+

Non-Injection Drug Use
INSTRUCTIONS-- The next set of questions are about smoking, sniffing, or snorting any drug that was not taken under a doctor's orders. This set of questions does not include times that a drug was taken by injection with a needle.

8. In the **past 3 months**, not counting drugs that you injected, how many times have you ever smoked, sniffed, snorted, or taken any drug just to get high?

0. No times
1. One time
2. Two times
3. 3-5 times
4. 6-10 times
5. More than 10 times

Please do not put your name or client ID number on this survey!

9. In the **past 3 months**, how often did you smoked, sniffed, snorted, or orally take any of the following: (On the line next to each drug tell me how you use it?

1.	Alcohol	_____	**0. No times**
2.	Marijuana/Hashish	_____	**1. One time**
3.	Powder Cocaine	_____	**2. Two times**
4.	Crack Cocaine	_____	**3. 3-5 times**
5.	Methamphetamine (Ecstasy/Speed/Ice)	_____	**4. 6-10 times**
6.	Heroin	_____	**5 More than 10 times**
7.	Other Opiates (Morphine/ Percocet/Oxy.)	_____	
8.	Psychedelics (LSD, mushrooms, PCP)	_____	
9.	Inhalants(glue, gasoline, paint thinner)	_____	
10.	Amphetamines(Uppers/Diet Pills)	_____	
11.	Xanax /Klonopin/Valium	_____	
12.	Street Methadone	_____	
13.	Cocaine and Heroin (mixed together)	_____	

10. How many times in the **past 3 month**, have you been drunk?

0. No times
1. One time
2. Two times
3. 3-5 times
4. 6-10 times
5. More than 10 times

B. Sexual Behavior (In the past 3 months)

1. How many people have you had sex with in the **past 3 months**?

0. None
1. One person
2. Two people
3. 3-5 people
4. 6-10 people
5. More than 10 people

2. How many of your sexual partners were female in the **past 3 months**?

0. None
1. One person
2. Two people
3. 3-5 people
4. 6-10 people
5. More than 10 people

3. How many of your sexual partners were male in the **past 3 months**?

0. None
1. One person
2. Two people
3. 3-5 people
4. 6-10 people
5. More than 10 people

Please do not put your name or client ID number on this survey!

4. How often have you used condoms when having sex with your regular partner(s) in the **past 3 months**? By regular partner, we mean someone that you have sex with on a consistent basis.

0. No regular partner/ no sex
1. Every time
2. Often
3. Sometimes
4. Rarely
5. Never

5. How often have you used condoms when you had sex with casual partners in the **past 3 months**? By casual partner, we mean having sex only one time with a person or sex without a commitment.

0. No casual partner/no sex
1. Every time
2. Often
3. Sometimes
4. Rarely
5. Never

6. How often have you used condoms when trading **(giving/getting)** sex for drugs or money in the **past 3 months**?

0. No trading of sex
1. Every time
2. Often
3. Sometimes
4. Rarely
5. Never

7. How many times in the **past 3 months** have you had anal sex?

0. No times
1. One time
2. Two times
3. 3-5 times
4. 6-10 times
5. More than 10 times

8. How many times in the **past 3 months** have you had oral sex?

0. No times
1. One time
2. Two times
3. 3-5 times
4. 6-10 times
5. More than 10 times

9. How many times in the **past 3 months** have you had vaginal sex?

0. No times
1. One time
2. Two times
3. 3-5 times
4. 6-10 times
5. More than 10 times

10. When you had sex without a condom in the **past 3months**, how many times was it:

With someone who shoots drugs with needles:

0. No times
1. One time
2. Two times
3. 3-5 times
4. 6-10 times
5. More than 10 times

With someone who sometimes smokes crack/cocaine:

0. No times
1. One time
2. Two times
3. 3-5 times
4. 6-10 times
5. More than 10 times

While you or your partner was high on drugs or alcohol:

0. No times
1. One time
2. Two times
3. 3-5 times
4. 6-10 times
5. More than 10 times

While trading (giving/getting) sex for drugs, money, or gifts:

0. No times
1. One time
2. Two times
3. 3-5 times
4. 6-10 times
5. More than 10 times

With someone who is not your spouse or primary partner:

0. No times
1. One time
2. Two times
3. 3-5 times
4. 6-10 times
5. More than 10 times

11. How many people do you know personally who have been infected with HIV/AIDS?

0. None
1. One person
2. Two people
3. 3-5 people
4. 6-10 people
5. More than 10 people

Please do not put your name or client ID number on this survey!

12. How many people do you know personally who have died because of HIV/AIDS?

0. None
1. One person
2. Two people
3. 3-5 people
4. 6-10 people
5. More than 10 people

13. How many times have you personally been infected with a sexually transmitted disease?

0. No times
1. One time
2. Two times
3. 3-5 times
4. 6-10 times
5. More than 10 times

C. Health Attitudes-Finally, I want to ask about your attitudes and concerns over the **<u>past 3 months</u>** about HIV. Tell me how much do you agree or disagree with each of these statements.

1. HIV/AIDS affects only gay men……	①	②	③	④	⑤
2. IV drug users are at risk for getting HIV……	①	②	③	④	⑤
3. Anal intercourse is the only way sex can…… can expose people to HIV	①	②	③	④	⑤
4. You can get HIV through contact with the …… blood of a person infected with HIV	①	②	③	④	⑤
5. You cannot get HIV by donating blood……	①	②	③	④	⑤
6. You can get HIV by shaking a person's hand……	①	②	③	④	⑤
7. HIV cannot be spread by sharing food……	①	②	③	④	⑤
8. Cleaning your works with soap and water …… kills the HIV virus	①	②	③	④	⑤
9. You can get HIV if you live in the same home…… with someone who is infected with HIV	①	②	③	④	⑤
10. HIV is contagious only if the person with…… HIV has symptoms you can see	①	②	③	④	⑤

<u>Please do not put your name or client ID number on this survey!</u>

11. I have already done things that could have…….. have exposed me to HIV	①	②	③	④
12. I never do anything that could give me HIV…….	①	②	③	④
13. I am not the kind of person who will get HIV……	①	②	③	④
14. I am not worried about passing HIV to others……..	①	②	③	④
15. Using condoms can reduce the chance of…… … getting/spreading HIV	①	②	③	④
16. The number of sex partners I have does……. not affect my chances of getting HIV	①	②	③	④
17. Cleaning works with bleach doesn't really……. affect a person's chance of getting HIV	①	②	③	④
18. People who share dirty works are at a greater…… risk of getting HIV	①	②	③	④
19. Using a condom is no trouble for me……	①	②	③	④
20. I'd rather get "dope sick" (withdrawal)……. than share works	①	②	③	④
21. Cleaning my works with bleach is too much bother……	①	②	③	④
22. If someone says his works are clean I'll share……	①	②	③	④
23. If someone objects to using a condom, I will…… not have sex with that person	①	②	③	④
24. There is no way for me to make using condoms……. sexy.	①	②	③	④
25. I could never talk to a sex partner about using……. condoms	①	②	③	④
26. In the year ahead, I will always use a condom use……. during vaginal and anal sex	①	②	③	④
27. In the year ahead, I will always use a condom use…….. during oral sex	①	②	③	④
28. In the year ahead, I will share works……..	①	②	③	④
29. In the year ahead, I might shoot up with works…… I get from someone else.	①	②	③	④
30. In the year ahead, I might share the cooker……	①	②	③	④
31. HIV/AIDS is the most frightening disease I know…….	①	②	③	④
32. The drug users I know would be insulted……. if someone refused to share works	①	②	③	④

Please do not put your name or client ID number on this survey!

33. The drug users I know don't like shoot to up without …. first cleaning their works	①	②	③	④
34. The drug users I know are concerned about…… getting HIV	①	②	③	④
35. My friends really haven't cut down on the number…… of people they have sex with	①	②	③	④
36. My friends are using condoms when they have sex……	①	②	③	④
37. My friends are not being careful to avoid HIV……..	①	②	③	④

Information and Education

Have you had face-to-face HIV education in the past year?

1. No
2. Yes

Have you ever been encourage to get tested for HIV?

1. No
2. Yes

Have you been tested for HIV prior to this study?

1. No
2. Yes

Have you ever tested positive for HIV/AIDS?

0. Never tested for HIV
1. No
2. Yes

Please do not put your name or client ID number on this survey!

DEMOGRAPHIC INFORMATION

1. What is your current age? _____

2. What is your race or ethnic background? ***(Please circle your response)***
    1. African American/Black
    2. White
    3. Hispanic
    4. Other **(specify)**:_____

3. What is your gender?
    1. Female
    2. Male

4. Where have you been living or staying most of the time in the **past 3 month**?
    1. With family or other relatives
    2. Living with boyfriend or girl friend
    3. With group of friends or a friend
    4. Alone in own apartment or home
    5. Homeless **(specify):** _____
    6. Hospital, rehabilitation facility,
    7. Jail, prison, or other correctional facility
    8. Other_____

5. What is your marital status?
    1. Never married
    2. Legally married
    3. Common Law Marriage
    4. Separated
    5. Divorced
    6. Widowed

6. What is the highest level of education you completed?
    1. Less than High School
    2. High School
    3. Some College
    4. College Graduate
    5. Graduate School

7. What is your employment status?
    1. Not employed
    2. Employed

8. What is your current legal status?
    1. No legal problems
    2. On probation only
    3. On parole only
    4. On probation and parole
    5. Awaiting charge, trial, or sentence
    6. Outstanding warrant
    7. Case pending
    8. Other _____

Please do not put your name or client ID number on this survey!

9. In 2006, what was your total income for the year? _____

10. What were your sources of support during the past year? **(Circle all that apply)**

1. Job
2. Unemployment
3. Mate/Spouse
4. Family or Friends
5. Welfare/Public Assistance/Disability
6. Prostitution
7. Selling Drugs
8. Other Illegal activities (i.e., stealing, robbery, burglary)
9. Others_____

11. How long have you been in treatment at Tadiso? _____

12. How many **other times** have you been in drug treatment? _____

13. What types of drug treatment have you attended? **(Circle all that apply)**

1. Out Patient Treatment
2. Partial Hospitalization
3. In Patient
4. Residential Rehab
5. Detox

PLEASE MAKE SURE YOU DIDN'T ACCIDENTALLY SKIP OVER ANY PAGE OF THIS SURVEY.

THANKS FOR YOUR PARTICIPATION!

Please do not put your name or client ID number on this survey!

APPENDIX D

INDIVIDUAL ITEMS CONSTITUENTS OF SCALES

Table 10 Appendix D: Depression

	Strongly Disagree N (%)	Agree N (%)	Disagree N (%)	Uncertain N (%)	Strongly Agree N (%)
I feel interested in life*	6 (3.0)	24 (12.0)	38 (19.0)	92 (46.0)	40 (20.0)
I feel sad or depressed	18 (9.0)	49 (24.5)	47 (23.5)	72 (36.0)	14 (7.0)
I feel extra tired or run down	13 (6.5)	51 (25.5)	37 (18.5)	85 (42.5)	14 (7.0)
I worry or brood a lot	15 (7.5)	52 (26.0)	40 (20.0)	77 (38.5)	16 (8.0)
I feel hopeless about the future	24 (12.0)	71 (35.5)	51 (25.5)	46 (23.0)	8 (4.0)
I feel lonely	23 (11.5)	68 (34.0)	39 (19.5)	60 (30.0)	10 (5.0)

* Reverse-coded item

Table 11 Appendix D: Anxiety

	Strongly Disagree N (%)	Agree N (%)	Disagree N (%)	Uncertain N (%)	Strongly Agree N (%)
I have trouble sleep	20 (10.0)	49 (24.5)	16 (8.0)	92 (46.0)	23 (11.5)
I have trouble concentrating or remembering things	19 (9.5)	56 (28.0)	32 (16.0)	74 (37.0)	19 (9.5)
I feel afraid of certain thing like elevators, crowds, or going out alone	38 (19.0)	74 (37.0)	21 (10.5)	52 (26.0)	25 (7.5)
I feel anxious or nervous	22 (11.0)	55 (27.5)	25 (12.5)	74 (37.0)	24 (12.0)
I have trouble sitting still for long time	19 (9.5)	70 (35.5)	22 (11.0)	68 (34.0)	21 (10.5)
I feel tense or keyed-up	19 (9.5)	61 (30.5)	31 (15.5)	71 (35.5)	18 (9.0)
I feel tightness or tension in my muscles	20 (10.0)	65 (32.5)	25 (12.5)	71 (35.5)	19 (9.5)

Table 12 Appendix D: Hostility

	Strongly Disagree N (%)	Agree N (%)	Disagree N (%)	Uncertain N (%)	Strongly Agree N (%)
I have carried weapons, like knives or guns	61 (30.5)	66 (33.0)	13 (6.5)	44 (22.0)	16 (8.0)
I feel a lot of anger inside me	32 (10.0)	66 (33.0)	37 (18.5)	49 (24.5)	16 (8.0)
I have a hot temper	31 (15.5)	73 (36.5)	35 (17.5)	41 (20.5)	20 (10.0)
I like others to feel afraid of me	68 (34.0)	96 (48.0)	13 (6.5)	20 (10.0)	3 (1.5)
I feel mistreated by other People	37 (18.5)	73 (36.5)	31 (15.5)	43 (21.5)	16 (8.0)
I get mad at other people easily	36 (18.0)	87 (43.5)	25 (12.5)	42 (21.0)	10 (5.0)
I have urges to fight or hurt others	61 (30.5)	79 (39.5)	21 (10.5)	28 (14.0)	11 (5.5)
My temper gets me into fights or other trouble	62 (31.0)	77 (38.5)	20 (10.0)	32 (16.0)	9 (4.5)

Table 13 Appendix D: Treatment Satisfaction

	Strongly Disagree N (%)	Agree N (%)	Disagree N (%)	Uncertain N (%)	Strongly Agree N (%)
Time schedules for counseling sessions are convenient for me	8 (4.0)	28 (14.0)	26 (13.0)	99 (49.5)	39 (19.5)
This program expects me to learn responsibility and self-discipline	2 (1.0)	16 (8.0)	22 (11.0)	120 (60.0)	40 (20.0)
This program is organized and run well	9 (4.5)	28 (14.0)	41 (20.5)	95 (47.5)	27 (13.5)
I am satisfied with this Program	8 (4.0)	37 (18.5)	33 (16.5)	92 (46.0)	30 (15.0)
The staff here is efficient at doing its job	9 (4.5)	27 (13.5)	35 (17.5)	102 (51.0)	27 (13.5)
I can get plenty of personal counseling at this program	5 (2.5)	21 (10.5)	26 (13.0)	108 (54.0)	40 (20.0)
This program location is convenient for me	19 (9.5)	45 (13.5)	25 (17.5)	80 (40.0)	31 (15.5)

Table 14 Appendix D: Counseling Rapport

	Strongly Disagree N (%)	Agree N (%)	Disagree N (%)	Uncertain N (%)	Strongly Agree N (%)
I trust my counselor	17 (8.5)	25 (12.5)	46 (23.0)	67 (33.5)	45 (22.5)
It's always easy to follow or understand what my counselor is trying to tell me	14 (7.0)	24 (12.0)	38 (19.0)	88 (44.0)	36 (18.0)
My counselor is easy to talk to	12 (6.0)	22 (11.0)	23 (11.5)	99 (49.5)	44 (22.0)
I am motivated and encouraged by my counselor	14 (7.0)	28 (14.0)	33 (16.5)	91 (45.5)	34 (17.0)
My counselor recognizes the progress I make in treatment	13 (6.5)	17 (8.5)	32 (16.0)	98 (49.0)	40 (20.0)
My counselor is well organized and prepared for each counseling session	13 (6.5)	19 (9.5)	29 (14.5)	101 (50.5)	38 (19.0)
My counselor is sensitive to my situation and problems	10 (5.0)	25 (12.5)	37 (18.5)	90 (45.0)	38 (19.0)
My counselor makes me Feel foolish or ashamed*	68 (34.0)	82 (41.0)	14 (7.0)	27 (13.5)	9 (4.5)
My counselor views my problems and situations realistically	8 (4.0)	15 (7.5)	42 (21.0)	96 (47.5)	39 (19.5)
My counselor helps me develop confidence in myself	11 (5.5)	22 (11.0)	42 (21.0)	95 (47.5)	30 (15.0)
My counselor respects me and my opinions	8 (4.0)	21 (10.5)	39 (19.5)	94 (47.0)	38 (19.0)
I can depend on my counselor's understanding	7 (3.5)	30 (15.0)	44 (22.0)	88 (44.0)	31 (15.5)

Table14 Appendix D: Counseling Rapport (Cont.)

	Strongly Disagree N (%)	Agree N (%)	Disagree N (%)	Uncertain N (%)	Strongly Agree N (%)
My treatment plan has reasonable objectives	2 (1.0)	8 (4.0)	39 (19.5)	122 (61.0)	29 (14.5)
My counselor allows me to give feedback in my treatment plan	2 (1.0)	14 (7.0)	24 (12.0)	124 (62.0)	36 (18.0)

* Reverse-coded item

Table 15 Appendix D: Treatment Participation

	Strongly Disagree N (%)	Agree N (%)	Disagree N (%)	Uncertain N (%)	Strongly Agree N (%)
I am willing to talk about my feelings during counseling	9 (4.5)	18 (9.0)	20 (10.0)	113 (56.5)	40 (20.0)
I have made progress with my drug/alcohol problems	8 (4.0)	4 (2.0)	22 (11.0)	115 (57.5)	51 (25.5)
I have learned to analyze and plan ways to solve my problems	7 (35.0)	17 (8.5)	37 (18.5)	111 (55.5)	28 (14.0)
I have made progress toward my treatment program goals	4 (2.0)	16 (8.0)	27 (13.5)	123 (61.5)	30 (15.0)
I always attend the counsel. scheduled for me	3 (1.5)	28 (14.0)	11 (5.5)	101 (50.5)	57 (28.5)
I have stopped or greatly reduced my drug use while in this program	4 (2.0)	19 (9.5)	17 (8.5)	100 (50.0)	60 (30.0)
I always participate actively in my counseling sessions	2 (1.0)	19 (9.5)	26 (13.0)	106 (53.0)	47 (23.5)
I have made progress understanding my feelings and behavior	3 (1.5)	17 (8.5)	30 (15.0)	120 (60.0)	30 (15.0)
I have improved my relations with other people because of this treatment	4 (2.0)	18 (9.0)	39 (19.5)	106 (53.0)	33 (16.5)
I have made progress with my emotional or psycho-logical issues	5 (2.5)	30 (15.0)	35 (17.5)	109 (54.5)	21 (11.0)
I feel comfortable giving negative feedback during counseling	7 (3.5)	34 (17.0)	28 (14.0)	109 (54.5)	32 (16.0)

Table 15 Appendix D: Treatment Participation (Cont.)

	Strongly Disagree	Agree	Disagree	Uncertain	Strongly Agree
	N (%)	N (%)	N (%)	N (%)	N (%)
I am following my counselor's guidance	6 (3.0)	15 (7.5)	50 (25.0)	97 (8.5)	32 (16.0)

Table 16 Appendix D: Injection Drug Use Risk

	No times/ None N (%)	One time/ One person N (%)	Two times/ Two people N (%)	3-5 times/ 3-5 people N (%)	6-10times/ 6-10 people N (%)	10– times/ 10 people N (%)
How many times have you injected any drugs in the past 3 months?	109 (54.5)	0 (0.0)	0 (0.0)	0 (0.0)	53 (26.5)	38 (19.0)
How many times in the past 3 months have you shared works after some-one else had already used them?	167 (83.5)	14 (7.0)	10 (5.0)	4 (2.0)	4 (2.0)	1 (.5)
How many people have used the same works before you in the past 3 months?	168 (84.0)	20 (10.0)	4 (2.0)	5 (2.5)	2 (1.0)	1 (.5)
How many times in the past 3 months has some-one shared works after you had used them?	162 (81.0)	16 (8.0)	8 (4.0)	9 (4.5)	3 (1.5)	2 (1.0)

	I do not Re-use N (%)	Every time N (%)	Often N (%)	Sometimes N (%)	Rarely N (%)	Never N (%)
How often, in the past 3 months, have you cleaned needles before re-using them?	125 (62.5)	30 (15.0)	14 (7.0)	9 (4.5)	8 (4.0)	14 (7.0)
Before using needles again, how often in the past 3 months did you use bleach to clean them?	124 (62.0)	18 (9.0)	9 (4.5)	15 (7.5)	10 (5.0)	24 (12.0)

Table 17 Appendix D: Non- Injection Drug Use Risk

	No times/ None	One time/ One person	Two times/ Two people	3-5 times/ 3-5 people	6-10times/ 6-10 people	10– times/ 10 people
	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)
In the past 3 months, how many times have you ever smoked, sniffed, snorted, or taken any drug just to get high?	6 (3.0)	9 (4.5)	17 (8.5)	37 (18.5)	26 (13.0)	105 (52.5)
How many times in the past 3 month, have you been drunk?	116 (58.0)	31 (15.5)	24 (12.0)	17 (8.5)	6 (3.0)	6 (3.0)
In the past 3 months, how often did you smoked, sniffed, snorted, or orally take any of the following:						
Alcohol	92 (46.0)	20 (10.0)	21 (10.5)	20 (10.0)	14 (7.0)	33 (16.5)
Marijuana/Hashish	110 (55.0)	19 (9.5)	11 (5.5)	7 (3.5)	12 (6.0)	41 (20.5)
Powder Cocaine	142 (71.0)	20 (10.0)	12 (6.0)	10 (5.0)	9 (4.5)	7 (3.5)
Crack Cocaine	114 (57.0)	12 (6.0)	16 (8.0)	16 (8.0)	14 (7.0)	28 (14.0)
Methamphetamine	186 (93.0)	4 (2.0)	5 (2.5)	0 (0.0)	1 (.5)	4 (2.0)
Heroin	112 (56.0)	14 (7.0)	15 (7.5)	22 (11.0)	12 (6.0)	25 (12.5)
Other Opiates	151 (75.5)	6 (3.0)	8 (4.0)	14 (7.0)	3 (1.5)	18 (9.0)
Psychedelics	191 (95.5)	4 (2.0)	2 (1.0)	1 (.5)	1 (.5)	1 (.5)

Table 17 Appendix D: Non-Injection Drug Use Risk (Cont.)

	No times/ None	One time/ One person	Two times/ Two people	3-5 times/ 3-5 people	6-10times/ 6-10 people	10+ times/ 10 people
	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)
Inhalants	195 (97.5)	3 (1.5)	2 (1.0)	0 (0.0)	0 (0.0)	0 (0.0)
Amphetamines	192 (96.0)	4 (4.0)	2 (1.0)	2 (1.0)	0 (0.0)	0 (0.0)
Xanax /Klonopin	100 (50.0)	14 (7.0)	13 (6.5)	18 (9.0)	12 (6.0)	43 (21.5)
Street Methadone	160 (80.0)	12 (6.0)	10 (5.0)	8 (4.0)	1 (.5)	9 (4.5)
Cocaine & Heroin (mixed together)	152 (76.0)	4 (2.0)	12 (6.0)	15 (7.5)	6 (3.0)	11 (5.5)

Table 18 Appendix D: Sex Risk

	No times/ None	One time/ One person	Two times/ Two people	3-5 times/ 3-5 people	6-10times/ 6-10 people	10– times/ 10 people
	N (%)	N (%)	N %)	N (%)	N (%)	N (%)
How many people have you had sex with in the past 3 months?	49 (24.5)	106 (53.0)	22 (11.0)	17 (8.5)	4 (2.0)	2 (1.0)
How many of your sexual partners were female in the past 3 months?	107 (53.5)	57 (28.5)	19 (9.5)	13 (6.5)	2 (1.0)	2 (1.0)
How many of your sexual partners were male in the past 3 months?	129 (64.5)	55 (27.5)	8 (4.0)	3 (1.5)	4 (2.0)	1 (.5)
How many times in the past 3 months have you had anal sex?	163 (81.5)	8 (4.0)	7 (3.5)	15 (7.5)	3 (1.5)	4 (2.0)
How many times in the 3 past months have you had vaginal sex?	78 (39.0)	18 (9.0)	26 (13.0)	28 (14.0)	20 (10.0)	30 (15.0)
How many times in the past 3 months have you had oral sex?	61 (30.5)	18 (9.0)	13 (6.5)	26 (13.0)	24 (12.0)	58 (29.0)
When you had sex without a condom in the past 3months, how many times was it:						
With someone who shoots drugs with needles?	155 (77.5)	15 (7.5)	9 (4.5)	5 (2.5)	4 (2.0)	12 (6.0)
With someone who smokes crack?	144 (72.0)	17 (8.5)	17 (8.5)	5 (2.5)	7 (3.5)	10 (5.0)
While you or your partner was high on drugs or alcohol?	110 (55.0)	23 (11.5)	23 (11.5)	21 (10.5)	11 (5.5)	12 (6.0)
While trading sex for drugs, money, or gifts?	172 (86.0)	9 (4.5)	8 (4.0)	3 (3.0)	3 (3.0)	5 (2.5)

Table 18 Appendix D: Sex Risk (Cont.)

	No times/ None	One time/ One person	Two times/ Two people	3-5 times/ 3-5 people	6-10times/ 6-10 people	10– times/ 10 people
	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)
With someone who is not your spouse or primary partner?	144 (72.0)	18 (9.0)	16 (8.0)	8 (4.0)	6 (3.0)	8 (4.0)
How many times have you personally been infected with a sexually transmitted disease?	107 (53.5)	47 (23.5)	27 (13.5)	13 (6.5)	4 (2.0)	2 (1.0)

	No Sex	Every time	Often	Sometimes	Rarely	Never
	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)
How often have you used condoms when having sex with your regular partner(s) in the past 3 months?	58 (29.0)	39 (19.5)	14 (7.0)	13 (6.5)	12 (6.0)	64 (32.0)
How often have you used condoms when you had sex with casual partners in the past 3 months?	102 (51.0)	41 (20.5)	13 (6.5)	12 (6.0)	5 (2.5)	27 (13.5)
How often have you used condoms when trading (giving/getting) sex for drugs or money in the past 3 months?	140 (70.0)	19 (9.5)	5 (2.5)	9 (4.5)	2 (1.0)	25 (12.5)

Table 19 Appendix D: AIDS RISK REDUCTION MODEL-HIV Knowledge

	Incorrect N (%)	Correct N (%)
HIV/AIDS affects only gay men	24 (12.0)	176 (88.0)
IV drug users are at risk for getting HIV	32 (16.0)	168 (84.0)
Anal intercourse is the only way sex can can expose people to HIV	37 (18.5)	163 (81.5)
You can get HIV through contact with the blood of a person infected with HIV	39 (19.5)	161 (80.5)
You cannot get HIV by donating blood	92 (46.0)	108 (54.0)
You can get HIV by shaking a person's hand	45 (22.5)	155 (77.5)
HIV cannot be spread by sharing food	95 (47.5)	105 (52.5)
Cleaning your works with soap and water kills the HIV virus	47 (23.5)	153 (76.5)
You can get HIV if you live in the same home with someone who is infected with HIV	71 (35.5)	129 (64.5)
HIV is contagious only if the person with HIV has symptoms you can see	36 (18.0)	164 (82.0)

Table 20 Appendix D: AIDS RISK REDUCTION MODEL

	Strongly Agree N (%)	Agree N (%)	Disagree N (%)	Strongly Disagree N (%)
Perceived Susceptibility				
I have already done things that could have exposed me to HIV	47 (23.5)	84 (42.0)	45 (22.5)	24 (12.0)
I never do anything that could give me HIV	22 (11.0)	56 (28.0)	90 (45.0)	32 (16.0)
Perceived Risk of Infection				
I am not the kind of person who will get HIV	18 (9.0)	49 (24.5)	100 (50.0)	33 (16.5)
I am not worried about passing HIV to others	43 (21.5)	67 (33.5)	67 (33.5)	23 (11.5)
Response Efficacy				
Using condoms can reduce the chance of getting/spreading HIV	75 (37.5)	101 (50.5)	11 (5.5)	13 (6.5)
The number of sex partners I have does not affect my chances of getting HIV	23 (11.5)	39 (19.5)	86 (43.0)	52 (26.0)
Cleaning works with bleach doesn't really affect a person's chance of getting HIV	22 (11.0)	40 (20.0)	100 (50.0)	38 (19.0)
People who share dirty works are at a greater risk of getting HIV	81 (40.5)	82 (41.0)	23 (11.5)	14 (7.0)
Self-Efficacy				
Using a condom is no trouble for me	40 (20.0)	85 (42.5)	56 (28.0)	19 (9.5)
I'd rather get "dope sick" (withdrawal) than share works	35 (17.5)	74 (37.0)	69 (34.5)	22 (11.0)
Cleaning my works with bleach is too much bother	10 (5.0)	29 (14.5)	104 (52.0)	56 (28.0)
If someone says his works are clean I'll share	8 (4.0)	34 (17.0)	97 (48.5)	61 (30.5)

Table 20 Appendix D: AIDS RISK REDUCTION MODEL (Cont.)

	Strongly Agree N (%)	Agree N (%)	Disagree N (%)	Strongly Disagree N (%)
If someone objects to using a condom, I will not have sex with that person	42 (21.0)	73 (36.5)	65 (32.5)	20 (10.0)
There is no way for me to make using condoms sexy	21 (10.5)	50 (25.0)	91 (45.5)	38 (19.0)
I could never talk to a sex partner about using condoms	14 (7.0)	33 (16.5)	103 (51.5)	50 (25.0)
Intended Risk Reduction				
In the year ahead, I will always use a condom during vaginal and anal sex	39 (19.5)	62 (31.0)	74 (37.0)	25 (12.5)
In the year ahead, I will always use a condom during oral sex	25 (12.5)	46 (23.0)	87 (43.5)	42 (21.0)
In the year ahead, I will share works	9 (4.5)	26 (13.0)	85 (42.5)	80 (40.0)
In the year ahead, I might shoot up with works I get from someone else	6 (3.0)	35 (17.5)	73 (36.5)	86 (43.0)
In the year ahead, I might share the cooker	8 (4.0)	55 (27.5)	64 (32.0)	73 (36.5)
Fear				
HIV/AIDS is the most frightening disease I know	98 (49.0)	70 (35.0)	27 (13.5)	5 (2.5)
Peer Norms				
Drug users I know would be insulted if someone refused to share works	24 (12.0)	47 (2.5)	91 (45.5)	36 (18.0)
The drug users I know don't like shoot to up without first cleaning their works	27 (13.5)	86 (43.0)	61 (30.5)	24 (12.0)
The drug users I know are concerned about getting HIV	43 (21.5)	86 (43.0)	61 (30.5)	9 (4.5)

Table 20 Appendix D: AIDS RISK REDUCTION MODEL (Cont.)

	Strongly Agree N (%)	Agree N (%)	Disagree N (%)	Strongly Disagree N (%)
My friends haven't cut down on the number of people they have sex with	22 (11.0)	81 (40.5)	77 (38.5)	17 (8.5)
My friends are using condoms when they have sex	18 (9.0)	74 (37.0)	93 (46.5)	10 (5.0)
My friends are not being careful to avoid HIV	18 (9.0)	82 (41.0)	72 (36.0)	23 (11.5)

	No N (%)	Yes N (%)
Informational Cues		
Have you had face-to-face HIV education in the past year?	71 (35.5)	129 (64.5)
Have you ever been encourage to get tested for HIV?	27 (13.5)	173 (86.5)
Have you been tested for HIV prior to this study?	33 (16.5)	167 (83.5)

	None N (%)	One person N (%)	Two people N (%)	3-5 people N (%)	6-10 people N (%)	10+ N (%)
Interpersonal Cues						
How many people do you know personally who have been infected with HIV?	84 (42.0)	20 (10.0)	37 (18.5)	32 (16.0)	15 (7.5)	12 (6.0)
How many people do you know personally who have died because of HIV?	82 (41.0)	36 (18.0)	30 (15.0)	33 (16.5)	11 (5.5)	8 (4.0)

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